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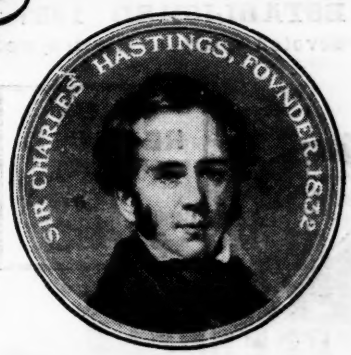

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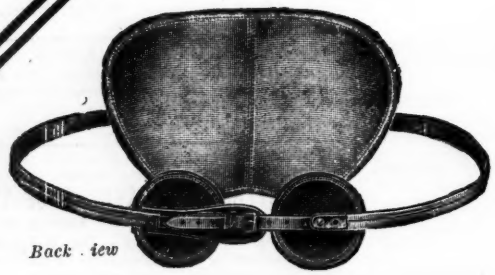

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OF THE

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PROCEEDINGS OF SECTIONS.

SECTION OF OBSTETRICS AND GYNAECOLOGY.

Professor EWEN J. MACLEAN, F.R.S.E., M.D., F.R.C.P., President.

DISCUSSION ON STILLBIRTHS AND NEO-NATAL DEATHS.

PRESIDENT'S INTRODUCTORY REMARKS.

IN opening the discussion, the PRESIDENT said that the national importance of the subject only needed to be mentioned to be accorded. Fertility was the index of the present and the earnest of the future prosperity and strength of a nation. Presumably it was for this reason that the law of the land claimed to punish with maximum penalties certain kinds of interference with pregnancy and negligent clinical practice. He thought that presumably even the contraceptionists would approve of their objective, though it seemed anomalous from the national point of view that their propaganda, whether by peer or peasant, in church congress or at the street corner, should be allowed to proceed unhampered. So far as the population of the country was concerned the requirement might arise in the not distant future for the law to develop an ante-conceptional in addition to a post-conceptional application. He thought they might proceed, however, without apprehension of the law to the consideration of their subject. The officers of the Section had been very fortunate to secure the services of the distinguished workers whose names appeared on the programme.

I.—ANTE-NATAL, INTRA-NATAL, AND NEO-NATAL DEATH:

CAUSES, PATHOLOGY, AND PREVENTION, WITH SPECIAL REFERENCE TO ANTE-NATAL DEATH.

BY

J. W. BALLANTYNE, M.D., F.R.C.P.E.,

Physician in Charge of the Ante natal Department of the Edinburgh Royal Maternity Hospital; Lecturer on Midwifery and Gynaecology (to Women Students) in the University of Edinburgh; etc.

The Discussion of 1888.

IT is a coincidence that thirty-four years ago (in 1888), when the British Medical Association last met in Glasgow, the Section of Obstetric Medicine was occupied with the subject of Intrauterine Death.[1] The discussion was opened by Professor (afterwards Sir Alexander) Simpson of Edinburgh; and those who took part in it were Dr. Barnes of London, Dr. (afterwards Sir John W.) Byers of Belfast, Dr. Fordyce Barker of New York, Dr. Parvin and Dr. H. P. C. Wilson, both from the United States, Dr. Aust Lawrence, Dr. Arthur W. Edis and Dr. Amand Routh of London, and the President of the Section (Dr. More Madden). All these men with one exception have passed from us, but the problem they were then striving to solve is now committed to us: *quasi cursores vitae lampada tradunt*, and their torch is in our hands to keep alight and to pass on to those who follow us. The present speaker was not present at the meeting referred to; but he was Assistant at the time to Professor Simpson, and it is perhaps significant that it was in that year that he began his researches into foetal diseases and monstrosities.

In one sense the discussion of 1888 had a more restricted range; it did not touch intra-natal death or neo-natal death, and so when Professor Simpson came to the subject of prevention he found himself limited to the consideration of mercury for syphilis, iron for maternal anaemia, diet for albuminuria, curettage for placental disease, potassium chlorate for recurrent foetal death or premature labour, and induction of premature delivery when in previous pregnancies the unborn infant tended to perish in the last weeks. Other speakers suggested the use of the tincture of *Viburnum prunifolium* in cases of recurring abortion from "irritable uterus," the correction of uterine displacements, the use of a spare diet and active exercise in instances of perversion of maternal nutrition, and the treatment of constipation. The giving of antisyphilitic medicines to the father was emphasized by Simpson; Edis was far-sighted enough to foresee the need for attention to numerous details in the pregnant woman and the giving to her the same care that a breeder bestowed upon his brood mares; and Routh referred to the detection and treatment of cases in which there was a slight degree of albuminuria. It is a noticeable fact that although Professor Simpson described fully and, making allowance for the lack of numerous observations, very thoroughly the pathology of intrauterine death, none of those who took part in the discussion followed him into this difficult and obscure field of research and speculation. He divided the causes of intrauterine death into (1) foetal, (2) maternal, and (3) placental; and he subdivided the placental into (*a*) neoplastic degenerations, (*b*) nutritional changes, including inflammations and degenerations, and (*c*) apoplectic changes.

The promoter of the discussion and those who took part in it were all men in the front rank of the profession in Britain and America. It may be concluded, therefore, that the occasion elicited the best and the most advanced thought on the subject of intrauterine death then in being. Further, there were recognizable in embryo, so to say, many of the advances in pathology and treatment which have since become so important. Yet it is not difficult to see the limitations of the subject as they then existed. There was no suggestion that it might be well that there be a co-ordinated and systematic investigation of the matter by observers working along similar lines in different centres; the idea of supervising all pregnant women in the interest of the few who were in danger of giving birth to dead infants was absent; treatment, although it was termed preventive, was recognized as beginning after the woman had been delivered of a stillbirth, and it was applied to later pregnancies; and, speaking generally, the individuality of the foetus in respect of its pathology was hardly realized. Further, in respect of syphilis, the typical cause, so to say, of intrauterine death, some fifteen years had still to elapse before the discovery of its causal spirochaete, and still longer before the coming of the Wassermann test and salvarsan and its wonder-working substitutes. As has already been noted, there was no reference at all made to death arising in the process of labour (intrauterine death) or in the early days of life from causes arising in the uterus, but becoming effective only after birth (neo-natal death). Finally, in 1888 there was not even the suggestion of notification, far less of registration, of stillbirths and abortions; consequently their frequency was pure conjecture.

Ante-natal and Post-natal Death.

Before reference is made to details there is one general consideration which calls for attention if the subject of discussion is to be intelligently approached; it deals with the fundamental difference which exists between death in an organism which is fully alive, such as a child or an adult, and death in an organism, such as a foetus, which is less evidently so. It is extraordinarily difficult to express this difference clearly, and yet it is extraordinarily important that it be done. One of the chief hindrances to clear definition is lack of exact and appropriate terminology. The phenomena of ante-natal and post-natal life are in certain respects different, and yet the same words are used or are attempted to be used to describe and define them. For instance, a newborn infant breathes, and so, too, does an unborn infant; but it requires only an instant's thought to convince the thinker that ante-natal breathing is a very different physiological process from post-natal breathing.

After birth respiration is a gaseous interchange between the atmospheric air and the blood as they circulate in the lungs; in the foetal state respiration is a gaseous interchange between two liquids, the maternal and the foetal blood, as they circulate in the placenta. The one is pulmonary, the other is placental; the one takes place via the nose, the other via the umbilicus; the former is practically the only function of the lungs, the latter is one of several functions performed by the placenta. The chief difference, however, is that post-natal respiration is aero-sanguine and that ante-natal respiration is sanguineo-sanguine. Of course the oxygen that the foetal blood receives from the maternal has come in the first instance from the atmosphere through the mother's lungs; but this does not really alter the contrast between the two circulations. In both cases the same term, respiration, is employed, and unconsciously in our thinking we transfer our

knowledge of post-natal pulmonary respiration to ante-natal placental respiration, thus darkening thought when clarity is essential. It will not quite meet the difficulty if "respiration" be reserved for the post-natal and pulmonary function, whilst "aerosis" is the term applied to the equivalent ante-natal and placental function; for aerosis unfortunately suggests the presence of air, the very suggestion that is to be avoided. One is not even justified in speaking of them as equivalent functions at all. The importance of these distinctions is manifest the moment that one begins to discuss the causes of ante-natal death, and as soon as one asks, How does a foetus die of suffocation? To many the picture of intrauterine suffocation from, say, a knot on the cord or a large haemorrhage into the placenta is that of an adult with the murderer's hands on his windpipe or with fumes of gas in the room; it is not necessarily the same, and in all probability is vastly different.

What has been said of the contrast between ante-natal and post-natal respiration may also be said, although the contrast is not so dramatic, of ante-natal digestion, excretion, hepatic action, and the corresponding fully developed functions after birth. It is necessary to alter the quality of one's concepts when thinking of these physiological processes as they occur before and after birth. Yet the same terms are applied indiscriminately. Confusion of thought results and fallacies easily creep in. It is as when a man accustomed to read modern English in roman type takes up an Early Middle English work printed in black letter; all the words are unfamiliar to his vision and some of them are unknown by his mind. In thinking of ante-natal phenomena, whether they be of life or of death, one has to be constantly watchful, intent, and prepared as it were to translate from one language into another. To do so with accuracy may, in the present state of our knowledge of ante-natal matters, be barely possible; but such a book as Dr. Feldman's *Ante-natal and Post-natal Child Physiology* will be of great service in preparing the way for exactness.

Special watchfulness in dealing with the problem of foetal death from suffocation—for example, in intra-natal asphyxia—is required. This is no matter of mere academic interest; it deserves close attention. One is sometimes apt to think of life as beginning at birth with the child's first breath: this, of course, is biologically quite erroneous. If a *terminus a quo* for individual existence is insisted upon, it must be found in the moment when the head of the sperm fuses with the nucleus of the ovum, and the zygote steps, so to say, upon the stage. A more common mistake is made when one regards the life after birth as a continuation with identical characters of the life which has gone before, and when one uses such a phrase as to resuscitate, reanimate, or restore the asphyxiated infant. As soon as the infant uses his lungs after birth he is alive in a new way; he was animate in the uterus, he is animate now, but the form or quality of his animation is different; he breathed then through his placenta, he breathes now through his lungs, and his other functions have similarly, although less obviously, undergone a change. For this passage from one form of vitality to another the writer proposed some years ago the word "transanimation," and he offers it again as worthy of adoption; it is not perfect, but it will serve to mark that there is a difference between the two forms of life. Under this new nomenclature one transanimates an asphyxiated newborn infant; one does not reanimate, restore, or resuscitate him. He is encouraged to pass over from one form of animated existence to another which is different in quality.

An appreciation of this fundamental difference between the life before and that after birth would have prevented some awkward misunderstandings in the use of such terms as stillbirth, apparent death, etc. In England, and recently in Scotland also, a stillbirth is simply a deadborn infant; but that was not always its meaning even in England. It is one of the few flaws in the magnificent *New English Dictionary* that it gives no other meaning than "deadborn" for "stillborn"; the very first illustrative quotation reads, "restoring children to life which were stillborn." Dr. James Blundell was professor of obstetric medicine at Guy's Hospital; in his work published in 1840 he had many passages showing that he did not regard "stillbirth" as synonymous with "deadbirth." On page 112, for instance, this sentence occurs: "The accoucheur will sometimes find that children are *stillborn*, as it is called—that is, although they are not dead, they do not cry, or manifest other indications of life." Blundell refers frequently to the resuscitation of stillborn children, and one regrets that the widespread usage of his time has been departed from. The word "stillborn" very accurately describes the state of the foetus who has not begun his post-natal life and yet who has not passed through death's portals; he is born, but *lies still;* nevertheless, he may be capable of transanimation. It is perhaps too much to hope that the word "stillbirth" should have its former meaning restored to it, for its identity with "deadbirth" has been stereotyped by the Central Midwives Board of both countries; but such a restoration of meaning would aid in simplifying the understanding of many phenomena of life about the time of birth. In the present discussion it is employed in its official sense of "deadbirth."

Causes of Stillbirths and Neo-natal Deaths.

From the standpoint of causation it is useful to look at early deaths under the three headings of ante-natal, intra-natal, and neo-natal; for each of the three groups thus established has a character peculiarly its own.

The group of causes acting in the ante-natal period of life is the most difficult of comprehension and statement. In chronological order it consists of a germinal, an embryonic, and a foetal time; and in each of these times death to the new organism may happen. Little is known of germinal deaths. A French writer (Vernet) long ago expressed himself somewhat epigrammatically thus: "*L'œuf fécondé jouit de la vie, sujet par conséquent aux maladies, à la mort,*" or, as we might render it, "The zygote gloriously exults in life, and so meets maladies and death itself in strife." In the very springs of life there is the possibility of death; but of the etiology of such death there is much ignorance. One expects that the great cause must be something transmitted to the zygote by one or other of the contracting parties, the ovum and the sperm. Some toxic condition of the parents, the impact of some racial poison such as alcohol or lead, may deprive the ovum of the power of going far as an independent organism or may weaken the sperm's embryogenetic effect. Professor Arthur Robinson, in his Sir John Struthers lecture (December, 1920),[2] has investigated this form of pre-natal death and has found that it may occur (in animals at any rate) in the stage of the ovum or of the zygote either when the latter is a morula or a blastula (attached or unattached to the decidua). He thinks that these deaths are not due to inflammation or to microbic attacks but simply to an incapability to live and develop properly under conditions which are quite favourable to immediately adjacent zygotes; he calls it unavoidable pre-natal mortality, and estimates it at 40 per cent. in the human subject. In addition, other zygotes die from alcohol, lead, *x* rays, and the like, constituting the avoidable pre-natal death rate. The usual clinical expression of all such deaths will be sterility. "Pre-natal death" is not a quite suitable name, for it is too wide; "germinal" or "zygotic" would, perhaps, be better.

With regard to deaths in the embryonic period of ante-natal life—that is, after the zygote has become attached to the decidual membranes and has differentiated into embryo and embryonic appendages, the clinical expression will be abortion. It must not be forgotten, however, that abortion due to some purely passing maternal cause will also result in death of the embryo or young foetus, for the expulsion of the non-viable organism puts it in an environment which is fatal to it. No clear distinction can be drawn between deaths in the germinal and deaths in the embryonic periods of ante-natal life; thus in the well-known hydatidiform mole embryonic death may possibly occur in the blastula stage, and the further pathological changes take place later in the embryonic appendages. Among recent work on embryonic deaths and deformities, that of the late Franklin P. Mall[3] stands out pre-eminently; the magnificent volume published by the Carnegie Institution of Washington, entitled *Studies on Abortuses*, by Mall and A. W. Meyer, is a notable addition to the literature of this difficult and yet immensely important subject. It is permissible to guess (one can hardly do more) that the causes of death in the germinal period continue to act in the embryonic, and that others come into play, such as all sorts of morbid changes in the decidual and embryonic membranes; it is certain that such deaths constitute a large part of ante-natal mortality. The subject, however, has great dimensions, and, as it is rather with foetal death after viability that this discussion is concerned, no further consideration can be given to it.

The result of foetal death after the arrival of the term of viability is, according to recent but incorrect terminology,

a stillbirth, and in the great majority of cases it is accompanied by the *post-mortem* change known as maceration. If the death have occurred only a day or two before labour and birth the macerative process may be so slight as to be unrecognizable by the naked eye, but such cases are not numerous. The causes of foetal death accompanied by maceration are difficult to group; the following is a useful if not a complete or an exact classification: (1) Syphilis transmitted from the mother. (2) All other kinds of infection or disease transmitted from the mother, and showing itself in similar form in the foetus, such as small-pox, measles, scarlet fever, malaria, pneumonia, tuberculosis (very rarely), cerebro-spinal meningitis, and typhoid fever. (3) Morbid states of the foetus dissimilar from the diseases in the mother which cause them, such as the foetal changes in maternal heart disease, in eclampsia and the pre-eclamptic state, in hepatic disease, in hyperemesis, etc. (4) Morbid states of the foetus the result of poisoning of the mother with lead, mercury, alcohol, nicotine, etc., including the drugs taken with criminal intent to produce abortion or premature labour. (5) Placental morbid changes of all sorts, but particularly of an haemorrhagic kind. There must necessarily be some overlapping between this and the other groups of causes, but it must be retained as a useful means of roughly separating the causes into maternal, foetal, and placental—an old but not an exact division. The placenta is, of course, the most important organ of ante-natal life, and therefore it is, when diseased, dominant in foetal death; possibly it gives the *coup de grâce*, so to say, in all foetal deaths, whatever be the initiating cause. (6) Morbid states of the foetal annexa other than the placenta, such as adhesions of the amnion, excess of the liquor amnii, etc. (7) Foetal traumatism, including knots and twisting of the umbilical cord, separation of the placenta, etc. (8) The so-called idiopathic diseases and malformations of the foetus, including general dropsy, ichthyosis, endocarditis, cystic kidneys, and all the grave monstrosities. (9) Morbid states of the foetus of an ancestral nature, such as haemophilia, in which the mother is unaffected but has transmitted something pathological to the offspring. This is a small and dwindling group, as is also (10) the group of causes acting directly from the father through the spermatozoon.

Holland[4] has adopted another system of classification for these ante-natal stillbirths, dividing the causes into primary, such as maternal albuminuria, and consequent factors, such as the associated placental state, the direct action of the maternal poisons, etc. There are advantages in this plan but also disadvantages, and it is indeed doubtful whether our present knowledge warrants a final choice of method of grouping.

It is not to be hastily concluded that all the causes enumerated above are always or even often lethal. It must not be forgotten that the interior of the uterus is perhaps the best place in which to have a disease or a malformation. Under normal circumstances the uterine cavity is free from pathogenic microbes, and even when these infest the maternal blood the placenta may protect the foetus against them; in all conditions the foetal environment is conducive to rapid and complete recovery. Further, the life of the unborn infant is not so easily endangered as that of the child after birth; so long as the placenta is healthy the foetus may live on although its tissues are grossly diseased or its organs malformed or even absent. In ante-natal circumstances life is compatible with conditions which are immediately lethal in the post-natal environment.

When one passes to the consideration of the causes of *intra-natal* death the last-named conclusion assumes great importance. The conditions which permitted ante-natal life to continue (although of course on a low plane of vitality) become immediately lethal as soon as the birth of the child begins and are obviously fatal as soon as it has ended. For example, a foetus with general foetal dropsy[5] may live in the non-exigent intrauterine environment, so long as the placenta remain active; but when it begins to pass through the maternal canals it may through its soft bulk be squeezed out of existence or killed by being tapped by the accoucheur or after birth it may find itself unable through the presence of fluid in its body cavities to commence pulmonary respiration. Marked monstrosities have the same effect; fused twins, for instance, may flourish *in utero*, but their passage through the pelvis may quickly prove fatal to them. To this peculiar kind of delayed lethal action I gave, long ago, the name of "potential mortality" when it proves fatal and of "potential morbidity" when it simply gives rise to symptoms. It may be compared to the state of the man with advanced heart-disease who rises from his bed and runs to catch a train, or of him who with a large aortic aneurysm allows someone to make him so angry that he "sees red."

In the first group, therefore, of the causes of intra-natal foetal death may be placed all the conditions (diseases and malformations) which have allowed the unborn child to survive, but which prove fatal to him during birth or immediately thereafter. In addition to those already named must be inserted pre-maturity and post-maturity. The second group will contain all the complications of labour, but especially those causing foetal asphyxia, such as separation of the placenta, placenta praevia, and prolapsed cord; those producing traumatism, such as the contracted pelvis and the large infant; and those leading to delay in birth, such as transverse and breech presentations, face cases, occipito-posterior positions, and the like. Into a third group will fall the intra-natal stillbirths, due directly to the methods of delivery: the cause may be, for instance, craniotomy, decapitation, or evisceration, soon to be abolished altogether one hopes; or it may be forceps extraction applied in unsuitable cases with the force of a craniotomy, or with an antero-posterior or oblique grip of the head; or it may be version done under unfavourable circumstances; or it may be the induction of a too premature labour. A fourth group of intra-natal causes are the infections: when labour is prolonged, especially after the rupture of the membranes, microbes may gain access to the foetus and set up disease, such as pneumonia from the pneumococcus and ophthalmia from the gonococcus; in most cases these intra-natal infections do not prove immediately fatal or even dangerous, but in some instances, as F. J. Browne[6] has shown, they do, and they must be added to the list of occasions of intra-natal death. In this group of causes it will be difficult to avoid overlapping, and death may follow not from one but from several etiological factors, primary and consequent; obviously the syphilitic foetus will be less able to withstand traumatism in the act of birth than an otherwise healthy one, and will die from the disease with, say, a visceral haemorrhage added on.

Some early *neo-natal* deaths are very closely connected with stillbirths. Morbid causes not potent enough to kill the foetus *in utero* or in the act of birth may be able to do so in the hours or days which follow the beginning of post-natal life. There are now, of course, new sources of danger. The foetus is now an infant and falls under the influence of causes of death from which he was shielded *in utero*. In order to prevent ambiguity in nomenclature it will be well to adopt Eardley Holland's definition[7] of the end of foetal life as coinciding with the commencement of pulmonary respiration; until it has breathed the foetus will remain a foetus, and post-natal life will not begin till then. The name "foetal death," therefore, will still be applicable if the intrauterine type of life present at birth is not transformed into the post-natal type—if, in other words, transanimation be unsuccessful. The awkwardness in nomenclature is unavoidable, for the vital statistician will be using one method of counting the beginning of life and the pathologist and obstetrician another; possibly a consultation between the two groups of persons who are interested in early neo-natal deaths would be productive of clarification of thought and regularization of practice and procedure.

The causes of early neo-natal deaths will include all these already in action in ante-natal and in intra-natal life; to these will fall to be added those which become effective after birth, comprising, of course, all the results of microbic infection made possible by the emergence of the foetus into the environment of post-natal life. At one time the writer thought of these new environmental causes as coming suddenly into play; but, as has been seen, this requires revision in the light of what has been discovered of the possibilities of intra-natal infection. To sum up, early neo-natal deaths may be due to (1) all the ante-natally developed conditions which without being absolutely incompatible with post-natal life yet render its continuance too difficult for it; (2) all the conditions contingent to birth which are due to traumatism or to infection then and which, while permitting the beginning of post-natal life, prevent its continuance; and (3) all the new dangerous or actually lethal conditions to which post-natal life is liable either from the stress of the new and less protecting environment or from the ignorance and folly of the persons into whose hands the new life is committed. With such a concentration and intensity of morbid causes in so new an environment there need be no surprise that the death rate of the first month is the highest recorded in the whole course of post-natal existence.

Pathology of Stillbirths and Neo-natal Deaths.

It is necessary at the very outset to state and to repeat the statement that there is no more difficult department of investigation than that of the pathology of ante-natal, intra-natal, and early post-natal death, and especially of ante-natal death. Omitting the further problems of germinal and embryonic death as outside the scope of the present communication, one is nevertheless faced by an immense field of unsolved problems. Admitting a multiplicity of little understood morbid causes, the investigator is met with the additional difficulty of the comprehension of their mode of action, a mode which must on account of peculiarities of environment and type of life be quite special and be further obscured by being carried on in the concealment of the uterine interior. It will require all the concentration of the workers under the conjoint scheme of investigation which has been set agoing so happily and wisely by the Medical Research Council to clear up not all, but simply some, of the problems of the pathology of ante-natal and early post-natal death, and this must be succeeded by specialized work along new lines to wrest the remaining secrets from "Nature's close reserve."

How, for instance, does an organism possessed of only ante-natal life die? What is the mechanism of the death of a foetus whose respiration is a tissue one and not a pulmonary? To what extent must one alter and adapt one's ordinary thinking when one is dealing with an organism in which integrity of tissue counts for little so long as the placenta remains active and healthy? How must one reconstruct one's notions of a death which is followed by *post-mortem* changes unaccompanied by putrefaction—death's usual livery, so to say? Even in respect of intra-natal and neo-natal death there must be special variations in mode of incidence and extension of pathological change. Adult or post-natal life stands upon a tripod of respiration, circulation, and innervation; but upon what does a foetal or an intra-natal life stand? Extraordinarily advanced morbid changes up to nearly complete destruction may be present in the foetal organs and yet ante-natal life continue; the foetal heart may cease in the act of birth and the newborn infant may lie without breathing for half an hour or longer, and yet in both cases post-natal life may be established and continue for seventy years. What is the pathology of, say, the oligopnoeic twilight-sleep baby?

Obviously there is a great and wide field for research here. Where must one begin? The answer is, in the first place, with the study of maceration. This peculiar non-putrefactive *post-mortem* change underlies the whole of the pathology of ante-natal death; it is the common basis of the morbid anatomy of the ante-natal stillbirth. Before one can rightly understand the pathology of the dead foetus one must have a clear mental picture both of the naked-eye and histological appearances of the macerative changes. One must construct, so to say, the common factor of maceration before one can differentiate the special changes due to individual diseases in the foetus and its placenta. The custom of saying that because the foetus was macerated there was no use in examining it microscopically or bacteriologically must be abandoned. There will be difficulty in recognizing what is merely macerative from what is distinctively the result of disease, but the difficulty is capable of being overcome. In this direction Dr. G. I. Strachan[8] (one of the research pathologists working under the Medical Research Council) has quite recently shown what may be accomplished; the exploration of the common histological picture of tissue lysis in the ante-natal environment is proceeding, and before long it will be possible unerringly to pick out the superadded and specific changes.

The dissociation of the composite photograph, so to say, of the pathology of the dead and diseased foetus will soon be a task easy of accomplishment. With this preliminary difficulty overcome further progress will be rapid, and the histological separation of simple maceration from, say, the changes peculiar to ante-natal syphilis will be a matter of routine. Of course, bacteriology will play a large part in all such work. Then, and only then, will it be possible to form as accurate an opinion upon the cause and mechanism of ante-natal death as one does now of post-natal dissolution at the necropsy of a child or an adult. A great deal more will have been accomplished: new light will be thrown upon the pathology and morbid anatomy of the child and adult, for it will be possible from the study of the foetus in which the processes are often uncomplicated by microbic invasion to reach the basal phenomena of tissue death. Another preliminary investigation not yet completed is the discovery of the laws regulating the transmission of microbes, toxins, toxic agents, and food substances through the placenta, to or from the foetus. Another line of investigation will be the exploration of the effect upon pathological changes in the foetus of the arrival of germs and toxins of disease and of toxic agents of all kinds by way of the umbilicus. It is difficult always to recollect that the avenue of entrance into the foetal economy is by the navel; but undoubtedly the fact is of great significance in regard to the distribution of lesions, the location of morbid processes, and the relative degree of injury done to various organs. For instance, when the typhoid organism arrives in the foetus via the umbilicus the lesions produced differ in their character, vary in their areas of maximum intensity, and attack with violence viscera hardly affected at all in child or adult, leaving others alone. Much here awaits the earnest worker. There are many other things to be done; but the writer is not offering an ordnance survey map on a generous scale of the territory of ante-natal disease and death—he is merely blazing a trail through a part of the country. As he said twenty years ago, the hinterland of ante-natal pathology is of immense extent, and it has been penetrated only by a few resolute explorers in a few directions.

Prevention of Stillbirths and Neo-natal Deaths.

The great purpose underlying all the investigation which has been outlined is the introduction of life-saving. It is true that the entrance into an undiscovered or little known country, whether that country be geographical, scientific, pathological, or histological, has the allurement of an adventure, and is a call to which the spirit of the searcher after novelty responds with alacrity; but if that were the sole incentive the advance would to me at least, and to many like-minded with myself, lack much of its true inspiration—namely, the reduction of fatalities in young life, the bringing into the world of stronger infants, and the relief of maternal suffering and disappointment. If David Livingstone had disappeared into Central Africa taking his life in his hands merely to bring back news of peoples, animals, mountains, rivers, strange, novel, or curious, his journey would indeed have been a wonderful achievement and well worthy of record in the annals of mankind. But it was to carry life that he put himself in jeopardy; it was to take remedies and cure of disease to the millions who had them not; it was to proclaim liberty to captives and death to slavery, and to open to the inward sight visions of a life with a marvellous content, with great and generous spaces, and with undreamed-of possibilities; and so he has passed into the front rank of the world's benefactors, and being dead he yet speaketh.

So, too, it is with the subject of to-day's discussion. We study stillbirths that we may prevent them; we attack death with scalpel, microscope, and culture medium; and we try to circumvent the ending of life before birth by ante-natal supervision and care. Death differs from disease in being amenable to prevention alone. So prevention of stillbirths is the one means of treatment. There will doubtless come a time when we shall be able to diagnose that a foetus is ill and in danger of death; in the meantime ante-natal diagnosis is chiefly guesswork, with the possible partial exception of syphilis, in which a positive Wassermann in the mother at least suggests a positive in the unborn infant; diagnosis, therefore, follows death, and consequently treatment must be preventive. Every expectant mother must be given preventive treatment in view of the possible death of her child *in utero*; all must be supervised to prevent the percentage incidence of stillbirths, which is indeed as yet unenumerated, but is surely known to be not small.

The general principles of the prevention of stillbirths can be clearly stated. In the first place it is necessary to watch for and treat every morbid condition of the mother which may be detected during the course of her pregnancy. If this be done with success the incidence either of these diseases in an identical form, or of their effects in a different form, upon the foetus will be prevented. There is not scope to give details, but one is thinking, of course, of syphilis, of albuminuria, and all the toxaemias, of the exanthemata, and of maternal heart, lung, and liver disease. It is not claimed that this treatment of the mother in her pregnancy will be sufficient. Prevention must begin before she is pregnant—it must go back to her childhood, and it must be directed towards her parents and even ancestors; but these are means for the future, and whilst they are important enough it is essential that the immediately possible thing be attempted first. Watchful, adequate supervision and treatment (when

needed) must therefore be given to all expectant mothers. This involves not merely the setting up of ante-natal clinics and the co-operation of all doctors who have in private practice the charge of obstetric cases, but also the provision of beds in hospitals and homes for ill expectant mothers. It means the hospitalization of the sick and pregnant in the population. This is being accomplished in a measure, but it must be general; it will mean great expense, but it has to be faced. To speak in military terminology, its chief objective will be the abolition of ante-natal death—in other words, the macerated foetus.

In the second place, it is necessary to watch for and correct every anomaly in the relation of the foetus to the mother, in the obstetric sense, before the oncoming of labour. This is for the purpose of preventing intra-natal death, and constitutes the second great purpose of the ante-natal clinic in hospitals and of ante-natal supervision in private practice. Again, it is impossible to name all the means available, but reference may be made to external version of podalic lies done in every case, but especially in the primipara; to rectification by the hands or by the useful expedient of pads in occipito-posterior positions in vertex presentations; to early recognition of contracted pelvis or of undue foetal size, and the consequent unhurried choice of the best method of delivery; and to early hospital observation of haemorrhage in the first or in the later months of pregnancy, with the elimination of the hopeless cases of placenta praevia brought into hospital after the occurrence of massive and devastating bleedings (rightly called "floodings"). There is obviously a great life-saving or stillbirth-prevention sphere in obstetric *prevision*. What hospital physician does not know and dread the case of pelvic contraction sent into his wards after forceps has been applied several times unsuccessfully outside? Who does not dread the persistent occipito-posterior late in the second stage of labour? What hopeful thing can be said of the woman bled white from the external haemorrhage of a neglected placenta praevia or from the concealed haemorrhage of a premature separation of the placenta when one sees her then for the first time? Every one of these emergencies is robbed of half its terrors if there has been ante-natal, adequate, alert supervision. And again, one is only skimming the surface of illustrative cases.

In the third place, to prevent intra-natal stillbirths a complete *revision* of all existing methods of delivery must be undertaken in the interest of the foetus. One must look afresh at everything. Every complication of labour (and there are not few) must as regards its management be critically reconsidered with the view of saving, if possible, both mother and infant. Here is the new law: In any case of difficult or dangerous labour, except when there is evidence that the foetus is already dead, that method of delivery should be chosen which without sensibly increasing the risk to the mother holds out a fair chance of life for the child. It might be more emphatically and uncompromisingly stated, but it will serve meanwhile. There is the case of placenta praevia: if the child be alive with a heart rate which does not suggest impending death, one ought to consider whether it is justifiable to employ the pelvic end of the infant as a plug to check the maternal bleeding at great risk to the infant and whether one ought not rather to do Caesarean section while the mother is in a condition to have it done with a comparatively small degree of danger. In every instance craniotomy on the living infant calls for the closest scrutiny. The new mental attitude to it should be: How has this obstetric disaster come about, and what ought to have been done to prevent it? What was the right thing to have done in, say, the persistent mento-posterior, the impacted occipito-posterior, the contracted pelvis, the large and possibly post-mature foetus, the locked twins, the prolapsed cord, and so on? Each case of craniotomy should be suspect.

It must be remembered that these three general principles in the prevention of stillbirths (ante-natal and intra-natal) must be applied in association in order to get the best results. They constitute what Eardley Holland's brilliant and felicitous phrase designates the strategy and the tactics of obstetric prevention; ante-natal supervision is the strategy and intelligent, far-sighted, intra-natal treatment is the tactics which together bring victory. The perfect victory is a live and undamaged mother and a living infant who is likely to continue living. Some years ago I counselled the would-be writers of works on obstetrics to put in a special chapter on ante-natal supervision; my advice now is, Let the principles of ante-natal supervision and intra-natal tactics on behalf of both mother and child so penetrate the whole book that there shall be no need for a special chapter.

As an instance of the supreme importance of co-operation between the ante-natal and intra-natal methods of prevention the case of syphilis in the woman with a contracted pelvis may be mentioned. If the woman have not had one or two courses of novarsenobenzol injections her foetus will arrive in labour with blood vessels so fragile that an ordinary forceps delivery or merely a long labour will cause a stillbirth; on the other hand the foetus may by ante-natal maternal treatment have been rendered practically normal, but forceps wrongly applied in labour may finish its chances.

In the fourth place there is a general principle which applies to early neo-natal deaths and their prevention. Some of these are extraordinarily nearly allied to stillbirths; some of them are the result of the very same causes which, acting more potently, produce stillbirth. There are, for instance, the intracerebral haemorrhages. Much more is now known about these accidents in labour or results of disease in pregnancy. The bleeding at birth may be insufficient to produce death; it may, however, cause asphyxia. It is only reasonable that the obstetrician have in mind what the infant has passed through and choose his treatment in accordance, so far as can be done, therewith; it is doubtful whether Schultze's pendulum swings are ever safe, but assuredly they are not good for a baby with blood oozing into the lateral ventricles of the brain. In other words, routine must be got rid of in the management of infants born into the world after difficult labours or abnormal ante-natal lives; the attempt must be made to differentiate the causes of their delicacy or disorder, and the appropriate treatment be given to each. The same intelligent consideration should follow the new-born child into and even past his neo-natal life. In other words the babies which may have been injured in birth or weakened before it should be "followed up." They should be put in a class by themselves; perchance they should be put in a ward by themselves; and all prematurely and post-maturely born infants should be regarded as their kith and kin.

Results.

If all the principles which have been set forth above are framed on right lines, and since ante-natal work has now been established for some time in certain places, there ought to be demonstrable the results which have been claimed in advance. The proportion of stillbirths to live births ought to have fallen. This result has been obtained. It is true that the evidence has come so far in trickles rather than in full flood, but it has come. I have already published results from the prematernity ward of the Edinburgh Royal Maternity Hospital which were highly encouraging; but I am now able to show contrasts between supervised and unsupervised cases by means of the wide sweep which the ante-natal clinics have reached within the past few years, and by the fact that statistics of stillbirths (founded, however, only upon notification) can now be had. I shall deal solely with the results in Edinburgh, simply noting in passing that in other places the good effect of ante-natal supervision has been as clearly proved. In fact, it has come to be a general statement that when ante-natal supervision on anything like an adequate scale is adopted the stillbirth rate falls by 50 per cent.

The stillbirth rate for the whole of extended Edinburgh in the year 1921 was 47·8 per 1,000, there being 9,028 births and 432 stillbirths (notification returns). About 30 per cent. of all the births occurred in connexion with the Royal Maternity Hospital—namely, 1,510 in the indoor department and 1,260 in the outdoor department and at the Leith Branch. There were 104 stillbirths in the intern department and 52 in the extern. The stillbirth rates, therefore, work out at 56·3 for the whole hospital, at 68·8 for the intern cases, and at 41·2 for the extern. During the year 816 expectant mothers attended the ante-natal clinics, including 138 suffering from venereal disease. There were also a number of venereal cases which came into the venereal disease department for delivery with no previous care at all, some of them having been transferred from the main part of the hospital where their infected condition was discovered during delivery. Among the 171 venereal disease births there were 27 stillbirths, or 157·8 per 1,000. The details of the 27 stillbirths yield noteworthy results: 1 was due to a craniotomy, rendered necessary by an error in judgement as to the relation of the foetal head to the pelvis—the mother had a positive Wassermann reaction; 15 were macerated, none of the mothers having had ante-natal treatment, 10 of them with positive and 5 with negative Wassermann; 11 were not macerated

—3 mothers with positive and 8 with negative Wassermann; of the 8 negatives, 1 mother had albuminuria, 1 marked anaemia; the remaining 6 stillbirths were due to the complications of labour—5 of the mothers had no ante-natal treatment.

If, therefore, the 171 venereal disease births be divided up into those which received ante-natal treatment (138) and those which did not (33); and the stillbirths be allocated amongst them, there are found to be 7 in the former (ante-natally supervised) group and 20 in the latter (not ante-natally supervised) group, giving stillbirth rates of 50.7 per 1,000 and 606 per 1,000 respectively. This is a very striking result. The maximum stillbirth rate is reached among the venereal disease cases which had received neither ante-natal obstetric supervision nor ante-natal antivenereal treatment (606); thereafter followed in order the rate for the intern cases (68.8), for the whole hospital (56.3), for the ante-natally supervised and treated venereal disease cases (50.7), for the whole city of extended Edinburgh (47.8), and for the extern cases of the hospital (41.2). If now, and finally, one looks at the stillbirths among the supervised patients at the ante-natal clinics who afterwards were delivered in connexion with the hospital and who were free from venereal diseases, one discovers an extraordinarily low rate. There were 4 stillbirths in 678 so supervised and non-infected cases, or a rate of 5.9 per 1,000.

Stillbirth Rates for Edinburgh in 1921.

For the whole (extended) city, 432 stillbirths in 9,028 births	47.8	per 1,000.
For the whole practice of the Royal Maternity Hospital, 156 stillbirths in 2,770 births ...	56.3	,,
For the Intern Department (104)	68.8	,,
For the Extern Department (52)	41.2	,,
For the Venereal Disease Department ...	157.8	,,
Receiving ante-natal supervision and treatment (7 in 138)	50.7	,,
Receiving neither ante-natal supervision nor treatment (20 in 33)	606.0	,,
For the whole practice of the hospital... ...	56.3	,,
For the 678 ante-natally supervised pregnancies (excluding the vencreal disease cases)	5.9	,,
For the 816 ante-natally supervised pregnancies (including the venereal disease cases)	13.5	,,

Thus the extremes are discovered: 606 per 1,000 among the expectant mothers suffering from the venereal diseases and with neither supervision nor antisyphilitic treatment in their pregnancies, and 5.9 per 1,000 among the women free from venereal disease and supervised and, if necessary, treated in their time of expectancy.

The third rate which is worthy of attention and scrutiny is 50.7 per 1,000 for the women suffering from venereal disease who received antisyphilitic treatment and were ante-natally supervised; this rate was actually less than that of the whole hospital, and was only 3 points above the average for the whole of the city. There is no need to add words to these figures. One sees where the danger lies, and one sees where the hope of improvement comes. One other rate should be referred to: when all the ante-natally supervised cases are considered together—that is to say, when the venereal disease cases who got ante-natal supervision and treatment are included—the stillbirth rate was 13.5. The two outstanding facts, therefore, are the evil influence of the venereal diseases, and especially of syphilis, in raising the number of stillbirths, and the good effect of ante-natal supervision and treatment even in the venereal diseases in lowering that rate.

It is necessary to remember, however, that these figures must not be regarded as quite free from fallacies. In the first place they have not been passed through the hands of a professed statistician, and they are therefore subject to correction; but whilst this scrutiny may modify them individually it will not alter the general direction in which they point. There is, for instance, some overlapping, some of the cases supervised in 1920 coming into the results of 1921, and some of those supervised in 1921 passing into the results of the present year (1922). Further, some of the cases seen at the ante-natal department were not confined in connexion with the hospital, for they had been sent from private practitioners or other institutions and returned to them for delivery; a few stillbirths may have occurred amongst them that were not reported, although the number must have been quite small. To counterbalance this, however, there is the fact that practically all the venereal cases were dealt with in the hospital, which is the head centre in Edinburgh for pregnancy cases affected with syphilis and gonorrhoea. A second qualification which one must remember is that the ante-natally supervised and treated patients included what one may call the better class of hospital cases; they comprise the women who came to arrange about their confinements beforehand, and thus showed their interest in their own health and that of their unborn infants. They were, so to say, good material, likely to yield good results. On the other hand, they also included the pregnant cases suffering from the venereal diseases which had been detected at the Venereal Disease Department in the Royal Infirmary and sent on, material which must be counted as decidedly overweighted with morbid possibilities. On the whole, therefore, there seems no reason to doubt the general accuracy of the results which, stated briefly, are: (1) the great loss of life in the form of stillbirths and the large proportion of these due to the venereal maladies; (2) the great gain accruing from ante-natal supervision and (when necessary) treatment even in the worst group of cases, the venereals; and (3) the preventable nature of a vast number of stillbirths.

The general conclusion of the whole matter seems to be that whilst much remains to be done in the study of the causes and pathology and pathogenesis of stillbirths it is possible to go forward at once in the prevention of them by ante-natal supervision and treatment with bright hopes of substantially reducing their number. Therefore every expectant mother and her unborn infant in the country ought to be able to receive efficient and adequate ante-natal care either from her own doctor or through the maternity hospitals and homes of her native land. I put this in the form of a resolution to the Section.

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II.—INTRA-NATAL DEATHS.

BY

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[*Abstract.*]

EXAMINATION of a large number of stillborn foetuses shows that a larger number have died from complications of labour than from maternal or foetal diseases. These foetuses are healthy and therefore worth saving. Classification of the causes of intra-natal death is a very difficult matter; for instance, in a case of placenta praevia the immediate cause of foetal death may be a cerebral haemorrhage due to manipulation made in attempting to control the maternal haemorrhage. A practical classification, therefore, is needed under the various primary causes—namely, maternal states, placental states, and foetal states. Evidence is to be found at *post-mortem* examination that the complications of labour account for 51 per cent. of foetal deaths. This *post-mortem* evidence consists as a rule in the presence of cerebral or visceral haemorrhages. In half the cases it is found that the tentorium cerebelli has been torn. This condition has been found in 88 per cent. of dead foetuses after normal breech delivery. The present teaching is to hurry the delivery of the after-coming head for fear of pressure on the cord. In the light of the evidence now brought forward this teaching must be revised, as actually the foetus is killed by compression of the head, brought on principally by forcible efforts being made to complete the extraction of the child. The head, therefore, should be allowed time, even so long as ten minutes if absolutely necessary.

[Dr. Eardley Holland illustrated his remarks by a lantern demonstration showing tears of the tentorium, and indicating the actual lines of stress in the falx and tentorium during extreme moulding of the head, which demonstrated the exact site where such tears must occur.]

III.—FOETAL DEATH DUE TO TOXAEMIA.

BY

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[*Abstract.*]

I APOLOGIZE for taking up the time of the meeting by speaking on a subject upon which I know so little. After some considerable investigation of the toxaemias of pregnancy my knowledge of this problematical condition seems to grow less, because the work has opened out such a vista of much that is unknown and perhaps also much of which is unknowable, as nature yields her mysteries very grudgingly to the seeker after knowledge.

The cause of foetal death in toxaemia is unknown, although we have gained considerable information as to the manner of death, which in most cases is due to asphyxia. We find total absorption of the foetus in early pregnancy with or without extrusion of the whole ovum. In later stages of foetal development we find anaemia, devitalized and oedematous tissues, arrested development of foetus and placenta, with the arrest of vital functions.

Pathological changes in the foetal organs are found which sometimes show the character of those in the maternal organism in cases of death from toxaemia such as eclampsia. Changes such as maceration merely show *post-mortem* degeneration of the foetus. The examination of the placenta and membranes contributes much to our knowledge of retroplacental and intraplacental haemorrhages, red and white infarctions, and necrosis, together with other degenerative processes such as the formation of vesicular mole or villous cystomata. These researches point to diseased conditions which have caused foetal death, but they are the investigations of results, not causes. The only method which will bring us nearer a solution of the problem of toxaemia is that whereby the maternal metabolism is investigated—namely, by skilled examination by clinical and laboratory methods of biochemical research. We must have some definite scheme or line of research to go upon, otherwise the problem will never be nearer a solution.

We know that the trophoblastic elements pour into the maternal blood stream substances, which have been called "ferments," "hormones," "toxins," and which we might as well call "*x*," or "the unknown quantity." These substances are normally neutralized by antibodies in the maternal blood before elimination takes place by the excretory organs. Toxaemia may occur when there is an excessive supply of toxins, when they are unduly concentrated, or when the excretory organs are defective. A combination of all these conditions may occur. As a result the foetus suffers ill health. The foetus may just survive because it is comparatively quiescent in its water bath in the uterus, but when labour occurs and an excessive supply of toxins is poured forth it collapses and dies. It may in some cases have sufficient vitality to survive normal exit at birth, but gives in when undue stress or strain is put upon it such as occurs in operative interference with labour and delivery. It may survive all adverse conditions only to succumb at varying intervals after birth. It is born alive, but may be looked upon as "a bad life" from our knowledge of its previous ill health as read through that of its mother's symptoms. The investigation of foetal welfare and foetal mortality is one of the most important branches of preventive medicine, and is the solution of a considerable amount of the prevention of infant mortality.

I would rather have the responsibility of foetal life than that of the infant, as I know I could obtain better results provided I had the requisite knowledge of conditions. It is for a greater knowledge that I plead in this paper. I do not for a moment say the welfare of the mother should ever be sacrificed for that of the foetus, but I do urge the necessity of looking upon the foetus as an individual requiring due consideration, and that reckless interference with its life should be carefully considered or abandoned in cases of toxaemia such as persistent vomiting. The life of the foetus in the eyes of the profession should be just as grave a responsibility as that of the child after birth. This is no new teaching, but is that of the Church itself.

The study of ante-natal work has taught us on two points. First, that already a great deal has been accomplished in the prevention of intra-natal death—as, for instance, in cases of accidental haemorrhage, eclampsia, not to mention other conditions outside the present discussion, such as contracted pelvis. The best results have occurred in this direction. Ante-natal care prevents foetal death by diminishing interference at the time of birth, and therefore ensures a healthier and more vitally resistant child. As to the second point, ante-natal care is diminishing intrauterine death of the foetus by reducing the number of abortions and premature expulsions of the foetus.

The results of this division are perhaps not quite so evident as those of the first, but in time they will prove themselves convincing. They are the most difficult problems with which we have to deal. Recurrent abortions other than those due to syphilis, habitual death of the foetus, and vesicular mole are classified as due to toxaemia; but how much nearer does that bring us to their solution? Examination of the placenta shows the results of a virulent poison which has been circulating in the maternal and foetal serum.

The main predisposing cause of toxaemia is in the intestine, and evidence of this is to be found in sepsis of the teeth, constipation, haemorrhoids, and renal deficiency, the recognition of which is of vital importance in the treatment of the condition. The patient keeps a fair balance of health until pregnancy occurs, when the whole metabolism is put out of gear. Other predisposing causes are general diseases, which have a devitalizing effect upon the foetus, and it must be remembered that the endocrinous organs play an important if unknown part in the aberrations of all metabolic functions.

True toxaemia of pregnancy is virulent in character, as shown in cases of eclampsia and *ante-partum* haemorrhage, and death of the foetus frequently occurs. Investigation of the causes of foetal death is useless unless the placenta is also examined.

It is found to be a difficult problem to make a diagnosis between toxaemia of pregnancy and previous renal insufficiency. A careful chemical analysis of the blood and urine must be carried out, and I now think it is essential to make an examination of the faeces as well. The mere presence of albumin in the urine is of little help in a diagnosis, although it is frequently associated with toxaemia and death of the foetus. The diagnosis of previous renal insufficiency is made out by the history both before pregnancy and after labour. Toxaemia as a rule clears up after the expulsion of the foetus.

Examination of the urine gives the amount of excretion alone; it must therefore be made in conjunction with the blood, which shows the degree of retention. The faeces show the presence of bacteria, a very important point in itself. It must be remembered that in some of the worst cases of eclampsia the urine gives no danger signals, and many cases of toxaemia, cardiac disease, chorea, etc., produce healthy children. As for the chemical tests for urine in toxaemia, there the confusion begins. Globulin is said to be an evidence of toxaemia (Mackenzie Wallis); albumin is associated with foetal death and sometimes disappears when the foetus dies *in utero*; albumin is found in *ante-partum* haemorrhage (42 per cent., Gordon Ley); urea is diminished in amount in destructive renal conditions (normal, 2.2 per cent.); it is diminished in eclampsia and persistent vomiting of pregnancy. The estimation of urea is best carried out by the urea concentration test. Diastase, according to Mackenzie Wallis, is high in toxaemia and low in renal disorders, but in my experience this has not proved a very stable occurrence. Opinions differ and oscillate at intervals as to the value of the ammonia excretion. The presence of diacetic acid is looked upon as a danger signal. It is possible that much information will be gained from the presence of indican, indol, and other derivatives.

In the blood examination, if the urea is high (normal, 0.02 to 0.05 per cent.) it is a sign of a serious condition, and if the foetus is viable the question of induction of labour may have to be considered. Toxaemia resulting in placental separation from necrosis or haemorrhage frequently causes asphyxia and therefore death of the foetus *in utero*.[1]

A differential diagnosis of toxaemia and renal disease may be of value in the prognosis of a case. On general lines toxaemia occurs more frequently in primiparae: there is oedema of the lower limbs; serum globulin is present in the urine, and the diastase is high (unchanged in blood); acidosis more frequently occurs. In renal disease symptoms occur more frequently in multiparae; there is oedema of the face

[1] For a scheme of investigation and general treatment see my paper in the BRITISH MEDICAL JOURNAL, March 4th, 1922, and communication on July 22nd, 1922.

and arms; serum albumin is present; diastase is low but high in the blood; albuminuric retinitis occurs sometimes, rarely found in toxaemia.

One may, however, go on for a considerable time discussing the various tests in use for the diagnosis of toxaemia and yet bring the subject very little nearer a practical solution. Something must be done to prevent enormous waste of foetal life, and it is of little use working under such isolated conditions as we are all doing at present. I would suggest the formation of a central committee under the control of the Ministry of Health and the Medical Research Council to discuss and carry out a scheme of investigation upon foetal welfare and mortality.

This committee should be composed of representatives of the British obstetrical societies, medical officers of health who are responsible for the work of midwives, specialists in diseases of infants, together with physiologists and pathologists—the latter including biochemists and bacteriologists. By such a committee a plan could be laid down for an organized investigation or research, and facilities could be given for work and financial aid. The notification of abortion is almost compulsory if we are going to acquire any information as to the enormous waste of foetal life.

The outcome of such research upon ante-natal conditions would not only result in a greater attention to foetal welfare, but would give results which would most clearly show the value of such preventive work in reducing the number of foetal deaths.

IV.—NEO-NATAL DEATH.

BY

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OUT of a series of 400 cases of stillbirth and neo-natal death which I have fully examined and classified there have been 153 cases of neo-natal death. The causes of death in these cases may be classified as follows:

A. *Traumatic:* Intra-natal—cerebral haemorrhage, suprarenal haemorrhage, other injuries, craniotomy; Post-natal—overlaying, injury during artificial respiration, other injuries.
B. *Infective:* Ante-natal—syphilis; Intra-natal—pneumonia, other intra-natal infections; Post-natal—pneumonia, other infections.
C. *Toxaemic:* Necrosis of liver.
D. *Developmental* (congenital abnormalities).
E. *Prematurity (per se).*
F. *Other conditions not peculiar to the newly born*—for example, volvulus, strangulated hernia, gastro-enteritis, intussusception, etc.
G. *Undetermined.*

I have time only to discuss very briefly some of the more important of the various causes classified in this table.

A. TRAUMATIC.

1. *Cerebral Haemorrhage.*

Of this I have met, amongst neo-natal deaths, with 53 cases. In 36 of these the haemorrhage was intraventricular—that is, into one or other or both lateral ventricles, or into the third or fourth ventricle. A study of all the cases of cerebral haemorrhage, including stillbirths, showed that amongst full-time infants with vertex presentation haemorrhage was practically confined to cases of difficult forceps delivery; indeed, I have only met with one case of cerebral haemorrhage in a full-time infant in which delivery was a natural vertex. In that case the child was post-mature, and labour, though natural, was prolonged and difficult. Further, if we take 3 per cent. as the normal frequency of breech delivery it is found that the latter is ten times as likely to give rise to cerebral haemorrhage as is delivery by the vertex.

One of the most striking points was the frequency of haemorrhage amongst premature infants, even when delivery had been easy and natural. During the last six months in the Edinburgh Royal Maternity Hospital one birth in every 13 was premature. Assuming this to be the normal frequency of premature labours in hospital practice, it is found that cerebral haemorrhage is ten times as likely to occur in premature labours as in labours at full time. This is a remarkable result when we consider the frequent difficulty of labours at term and the ease with which it takes place when the child is premature. The explanation is doubtless to be found in the great delicacy of the vessels in the premature foetus and the mobility of the bones of the cranial vault. The liability to cerebral haemorrhage in premature infants was found to be greatest at seven to seven and a half months, less at eight months, while at eight and a half months the liability appeared to be no greater than at full time. I use the word "months" here advisedly because in a general way it is probably as accurate as if we attempted to estimate the duration of pregnancy in weeks or days from the usual data.

Intraventricular haemorrhage is, in my experience, practically never met with except in premature infants. It was about ten times as likely to occur in breech as in vertex deliveries. The duration of life in these cases varied from half an hour to sixteen days, and it is not uncommon for an infant to live for forty-eight hours with both lateral ventricles distended with blood clot. The case which lived for sixteen days was a seven and a half months infant in which a large clot distended the left lateral ventricle. It is unusual for the infant in these cases of intraventricular haemorrhage to show any signs which might localize the site of the haemorrhage. It is usually blue, cries weakly, feeds badly, and, if it lives sufficiently long, gradually wastes away.

Operability.—It was remarkable that in none of my cases of cerebral haemorrhage, except in one seven and a half months' infant which lived three days, could operation have been undertaken with any hope of permanent success. In all the others failure must have resulted, partly because although in some cases part of the clot could have been removed it was associated with haemorrhage in other inaccessible parts of the brain, such as in the ventricles, over the corpus callosum, or over the base, or with haemorrhage in other organs like the suprarenal or lung, which in itself would probably have proved fatal. Besides, so many of these infants, the victims of cerebral haemorrhage, become infected with pneumonia, which almost always terminates fatally in a day or two.

The chief points to be kept in mind in the prevention of cerebral haemorrhage are, then, as follows: (1) Avoidance of breech delivery by carrying out cephalic version, whenever possible, before the onset of labour and preferably at about eight to eight and a half months. (2) Avoidance of difficult forceps deliveries. This is only possible by the adequate ante-natal supervision of every case. (3) By limiting the induction of premature labour to cases which have reached the thirty-fifth week of pregnancy; by avoiding the use of forceps in the premature child, preserving the membranes unruptured as long as possible, and manual dilatation of the cervix and vagina in front of the advancing head. The same object may be achieved by the use of hydrostatic dilators.

2. *Suprarenal Haemorrhage.*

Altogether I have met with 27 cases of suprarenal haemorrhage, but in only 6 of these was the child born alive. In severe cases of suprarenal haemorrhage the child is usually dead or stillborn, sometimes in a condition of white asphyxia, and fails to respond to restorative measures. The medulla of one or both capsules in such cases is found to be distended with blood clot. Only very occasionally has the haemorrhage burst into the peritoneal cavity, and the cause of death is not the amount of blood lost but the shock caused by the involvement of the sympathetic nervous structures of the medulla. When the infant survives birth it usually only does so for a few hours, but I have met with one case which lived for four days. There was a massive haemorrhage in the cortex and medulla of the right suprarenal, associated with haemorrhage into the cortex and pyramids of both kidneys, practically destroying the parenchyma in the haemorrhagic areas. The child was born at full time by the breech, internal podalic version having been performed on account of lateral placenta praevia.

Suprarenal haemorrhage is almost entirely found in cases of difficult forceps and of breech delivery; it was found to be twenty-two times as likely to be associated with breech delivery as with delivery by the vertex. As regards maturity, it was found to be about three times as likely to occur in premature labours as in labours at term.

3. *Other Injuries.*

Amongst these are comprised such conditions as subcapsular haemorrhages in the liver, some of which may burst into the peritoneal cavity, massive haemorrhages in the lungs, and haemorrhage in the kidneys. A few cases of craniotomy in which the infant breathed after birth must be included in a classification of the causes of neo-natal death, but the distinction from craniotomy as a cause of *intra-natal death* is merely of academic interest and has no practical importance.

* Working under the Medical Research Council.

B. INFECTION AS A CAUSE OF POST-NATAL DEATH.

We now come to the next large group of causes of post-natal death—namely, the infective causes, which may be conveniently divided into ante-natal, intra-natal, and post-natal, according to the time when the infection occurs.

Syphilis.

Under ante-natal causes the most important is syphilis. Altogether I have examined 35 cases in which the cause of neo-natal death was put down as syphilis. With the exception of one infant which lived for six weeks, all died within two weeks after birth, and in a few cases the infant only gasped once or twice. What are the points that will assist us in making a diagnosis of syphilis in these cases?

1. *A History or Clinical Evidence of Syphilis in the Mother.*—Such a history is in reality rather infrequently found. Thus, out of 17 macerated syphilitic foetuses in whom the maternal history could be fully obtained, in 13 cases there was no maternal history or clinical evidence of syphilis. It is, however, significant that all those who gave evidence of syphilis were, with one exception, primiparae, whilst all the others were multiparae, and were with two exceptions, judging from the obstetrical history, cases of old-standing infection. I think it is likely that in such cases the past evidences of secondary syphilis had been overlooked by the mother on account of the lapse of years.

2. *A Bad Obstetrical History in the Mother.*—In a multipara there is generally, unless where the infection has been a recent one, a history of stillbirth, abortions, or neo-natal death. I have noticed that the sequence of events is frequently rather different from the textbook picture, which is that the first pregnancies after infection end in abortions or in the birth of macerated foetuses, while in later pregnancies the child may be born prematurely with lesions of syphilis and soon die. Still later it may remain apparently healthy for years. More frequently in my experience there is a succession of macerated foetuses, or a macerated foetus may be succeeded by a child which lives for a few weeks, months, or years, only to be followed again by a macerated foetus or an abortion. Such an apparently indiscriminate mixture might be explained by a fresh infection, but I have never found anything in the clinical history to suggest that, and the matter is one more added to the many difficult problems of latent syphilis.

3. *A Positive Wassermann Reaction in the Mother.*—A positive Wassermann reaction is very often absent in old cases of maternal syphilis. On the other hand, one not infrequently finds a strongly positive blood Wassermann in the mother, where the child shows no evidence of syphilis either naked-eye or microscopic. The test is therefore at best merely an aid to diagnosis.

4. *Presence of Syphilitic Changes in the Placenta.*—The weight ratio of the normal placenta varies from 4 to 13. In my syphilitic cases I have found that the placenta was definitely enlarged in 50 per cent., so that its weight ratio exceeded 4. Even when there is not this definite increase of weight ratio the syphilitic placenta may often be recognized by its pallor and by its unusual thickness. Greater assistance is usually obtained, however, by the microscopical examination, which shows the villi to be enlarged and non-vascular, with a consequent diminution of the intervillous space. The enlargement of the individual villi explains the enlargement of the placenta as a whole. When we consider that the weight ratio of the normal placenta varies from 4 to 13 we see why it may be said that the syphilitic placenta is always enlarged—that is, it is enlarged for that particular placenta, which, had it been normal, would have had a low weight ratio. While it is true that microscopical examination of the placenta is of the greatest assistance, yet border-line cases are not infrequently met with in which a dogmatic pronouncement is impossible.

5. *Signs in the Child itself.*—The child is usually premature and badly nourished, and it may show clinical evidence of syphilis in the form of skin eruptions.

(*a*) *Presence of Spirochaetes in the Foetal Organs.*—This is the only absolute sign of syphilis. While in the macerated syphilitic foetus I have found them present in 70 per cent. of cases, in the fresh syphilitic I have only found them present in 4 out of 32 cases, or 12.5 per cent. One of those syphilitics in which I failed to find spirochaetes was the twin of a macerated foetus, in whose organs they were especially numerous.

(*b*) *Enlargement of the Liver.*—It seems to be an almost universal belief that liver enlargement is constantly present in syphilis of the newly born. I am quite sure that this is by no means so. Thus of 100 full-time fresh normal foetuses in which syphilis was carefully excluded the mean ratio of the liver was 21.1, but amongst these was a liver with a weight ratio of 13.3, one of 14, one of 14.4, etc. Of 14 full-time fresh syphilitic foetuses I found the mean ratio to be 19.9, amongst which there were only 2 with a weight ratio heavier than 13.3, which was the heaviest weight ratio amongst the full-time healthy foetuses. The weight ratios of these 2 were respectively 12 and 13. Amongst 14 eight to eight and a half months syphilitic foetuses only one had a weight ratio (12.5) heavier than the heaviest normal (14).

Amongst seven to seven and a half months' infants a heavier weight ratio was actually found in the case of one which was normal (12.5) than in any of the syphilitics at this period, the heaviest weight ratio amongst which was 13. It is true that the mean ratio of a large series of syphilitic livers is heavier than that of a large series of healthy livers, but in dealing with an individual case averages do not help. What does help is to know whether that particular liver is abnormally large, and it is only abnormally large if it is heavier than the heaviest normal. Of 35 syphilitic infants born alive I have only met with an abnormally heavy liver in 5, or 14 per cent. It is interesting to note that Holland* has arrived at a somewhat similar conclusion; he says, "Enlargement of the liver is worthless as a diagnostic sign of syphilis if taken by itself, for it is so often found in definitely non-syphilitic foetuses."

(*c*) *Enlargement of the Spleen.*—This I have found a more helpful and reliable test. Thus, out of the 35 fresh syphilitics it was found that in 12, or 35 per cent., the weight ratio of the spleen was increased so as to be greater than that of any normal spleen that I have met with.

The heaviest weight ratio in a series of 100 full-time healthy spleens was 177, while of 42 cases at eight to eight and a half months it was 155. The latter was the heaviest weight ratio I have ever found in a healthy spleen. Therefore a weight ratio definitely higher than this should be looked upon as an abnormal enlargement, and as strong evidence in favour of syphilis. The edges of the syphilitic spleen are usually rounded; on section the Malpighian bodies are poorly marked, and microscopically the enlargement is found to be almost entirely due to a hyperplasia, with, as a rule, no definite increase in the reticulum or plasma cells.

(*d*) *Chondro-epiphysitis.*—While in the macerated foetus chondro-epiphysitis was present in the majority of cases of syphilis, in the fresh syphilitic I have found its presence comparatively infrequent. Thus, out of my last 11 cases I found it absent in 6, indefinite in 3, and definitely present in 2. Increased experience has served to confirm me in my conviction that if absence of chondro-epiphysitis be relied upon as evidence of the absence of syphilis, then a large proportion of syphilitics will be overlooked.

This concludes the evidence of syphilis usually found by naked-eye examination. I have only once or twice met with pneumonia alba sufficiently well marked to cause changes visible to the naked eye. The thyroid and pancreas may be firmer and paler than normal if they are the seat of interstitial change, but the alteration in appearance and consistency is never definite enough to be of assistance in diagnosis.

It is thus apparent that one may review the maternal history, examine the placenta, and carry out a careful *post-mortem* examination and still be left in doubt as to the presence of syphilis. In such cases the greatest assistance is obtained from histological examination of the organs, especially of the thyroid, thymus, lungs, liver, and pancreas, in some or all of which changes of the greatest importance may be found, and which are briefly as follows:

Thyroid.—Increase of the interacinar connective tissue, which presses upon and destroys the acini more or less completely. There is absence of colloid and proliferation of the cells lining the acini into the lumen.

Thymus.—If the child is marasmic the thymus is atrophied and weighs as little as 2 or 3 grams instead of the usual 8 or 10 grams. The cortex of the lobule has disappeared and only the medulla remains; lymphocytes are exceedingly few, and this accounts for absence of the thymus juice on squeezing the cut surface. There is marked increase of the connective tissue in the lobules and the interlobular septa are much thickened. In addition there is a peculiar change in the corpuscles of Hassall, which are enlarged; and their contents

* Report on the Causation of Foetal Death. Ministry of Health Reports, 1922, p. 33.

are altered so that the concentric body is replaced by a mass of granular débris with a few polymorphonuclear leucocytes.

Lungs.—There is increase of interstitial tissue in the alveolar walls caused by proliferation of the fine connective tissue forming the basement membrane of the endothelial lining of the alveolar and of the interalveolar capillaries. As a result the alveolar walls are thickened, the alveolar spaces are proportionately diminished, and the capillaries are compressed and partially obliterated. The endothelial cells lining the alveoli are shed into the lumen, which they loosely fill, appearing as large flattened phagocytal cells containing pigment. There is at the same time thickening of the adventitial coat of the blood vessels and of the fibrous coat of the bronchi. A rarer change is the transformation of the endothelial cells lining the alveoli into low columnar cells which line the alveoli in regular formation, so that at first sight the alveoli resemble the acini of a secreting gland like the pancreas. There is at the same time a thickening of the basement membrane of the alveoli, and the thickened tissue is arranged in concentric layers. In early foetal life the alveoli are normally lined by a cubical epithelium, which becomes flattened out after air enters the lungs, but I have never met with such a high columnar epithelium in normal cases. In one case microscopic gummata were present in the lungs, containing lymphocytes, plasma cells, and endothelial cells.

Liver.—Microscopically the following changes are met with: (*a*) *Periportal cirrhosis*—the commonest change. In one case it was combined with necrosis of the central zone of the lobule. The periportal tract contains young connective tissue cells and a few plasma cells. (*b*) *Intercellular cirrhosis.* The liver cells are divided up into small groups by a very fine connective tissue which arises from the basement membrane lining the sinusoids. (*c*) *Haemopoietic liver.* The blood-forming function of the liver normally present during intra-uterine life is continued and exaggerated so that the sinusoids contain large numbers of embryonic blood cells. A similar condition is found in general oedema of the foetus, and in both is probably the response of the liver to the call for new blood cells in order to compensate for the abnormal destruction caused by the action of the syphilitic or other toxin. (*d*) *Miliary gummata:* this is, in my experience, the rarest form of liver syphilis. The gummata are visible to the naked eye as minute greyish spots dotted thickly all over the cut surface. Microscopically they are seen to consist of collections of fixed connective tissue cells and endothelial cells, scattered apparently indiscriminately throughout the liver tissue. In later stages the centres of the gummata may be occupied by a caseous-looking material due to waxy change in the fused connective tissue cells of the gumma. These gummata may be the only change present, or they may be combined with periportal or fine cirrhosis. I have not found spirochaetes in the gummata, but in the more normal liver tissue immediately surrounding them.

Pancreas.—This organ is one of those most frequently affected, and shows fibrosis with compression and destruction of acini.

Pituitary.—This may show interstitial change in both the anterior and posterior lobes. In one infant in which the lesion was very marked there were at birth some signs of hypopituitarism, chiefly shown in stumpy growth and some increase in adiposity. Though it was only a twenty-eight weeks' foetus its skin was the colour of a foetus at term, while its length was only 33 cm. (13 inches). The pars anterior was much fibrosed with compression of the gland elements; amongst the new fibrous tissue there were cellular elements, probably remains of cells of the pituitary which had become included. The cells were almost all chromophile and basophile, only a few eosinophiles being present. The absence of chromophobe cells may be explained by a compensatory hyperactivity of the secretory tissue which has escaped destruction. In the pars nervosa there appeared to be an increase of neuroglia, but this was somewhat indefinite.

It will be observed that the histological changes in the organs are, generally speaking, of the nature of an increase of the normal interstitial tissue. The condition is therefore an exaggeration of a normal condition, and therein lies the chief difficulty in the diagnosis of syphilis from the histological appearances. The amount of interstitial tissue normally present in an organ varies within fairly wide limits, and there is no constant standard against which the amount of interstitial tissue present in any given case can be measured. When the interstitial change is pronounced there is little difficulty, but there are border-line cases which will puzzle even an expert, and in which it is impossible to say that the changes are definite enough to be characteristic of syphilis. In such cases I think the proper course is to refuse to give a definite diagnosis of syphilis.

Pneumonia.

Pneumonia is in my experience the commonest cause of post-natal death, and was present in 48 cases, or 31 per cent. It is of the catarrhal type and runs a rapid course, usually ending fatally in two or three days, during which time the infant presents few or no symptoms which might draw attention to the condition. In a former paper on this subject I stated my conviction that in some cases the disease must have been present and even well advanced before birth. I had examined a child which lived for only eight hours after birth and found pleural effusion and both lungs solid with pneumonia in the stage of grey hepatization. The infant had been cyanosed and breathed badly from birth. The membranes had been ruptured for a long time before delivery, the cause of the delayed labour being primary uterine inertia. In another case in which the membranes were ruptured three days before birth the child died on the third day after birth, and at *post-mortem* examination evidence was found of pneumonia, double empyema, and septic endocarditis. Breathing from birth had been wheezy and rapid.

Since then I have been able to place the matter beyond doubt and to prove that at birth an infant may be suffering from advanced pneumonia, as I have found catarrhal pneumonia in five infants which were deadborn, four of them by craniotomy, and in another which, also born by craniotomy, lived for a few minutes after birth. All were cases of prolonged labour, with early rupture of membranes.

In the case of that infant which, delivered by craniotomy, lived for a few minutes after birth the mother had been in labour for ten hours and the membranes ruptured for thirty-six hours before admission to hospital. Delivery was effected by craniotomy after unsuccessful application of forceps, fifty-six hours after rupture of the membranes. The lungs in this case showed catarrhal pneumonia in a fairly advanced stage. The alveoli were filled with polymorphonuclear leucocytes, endothelial cells, and granular débris, and the disease was already passing over into the stage of grey hepatization. The infecting organism is most usually *Bacillus coli*, which probably makes its way from the vagina into the ruptured amniotic sac and thence by aspiration or continuous surface growth to the mouth, nose, and lungs of the foetus. Cultures from the throat of an apparently healthy infant taken immediately after birth, and in which the membranes had been ruptured sixty hours before delivery, yielded a growth of *B. coli* and a diphtheroid organism.

I should like to refer very briefly to a type of pneumonia that would seem to be peculiar to the newly born infant and of which I have met with eight cases. This might appropriately be called "acute haemorrhagic pneumonia of infants" and its course is somewhat as follows:

> The child, generally a few days old, may appear perfectly healthy, and an hour later may be found dead by its mother's side or in its cot. The body is pallid and there may be a little blood-staining about the mouth or nostrils. Death has occurred with tragic suddenness, and there may be suspicion of foul play or overlaying. What has happened is this: an infection of the child's lungs has occurred followed by acute congestion, and the delicate capillaries of the lung, being unable to bear the sudden strain, give way, with the result that the alveoli and bronchi are flooded with haemorrhage and the child suddenly dies, drowned in its own blood. At *post-mortem* examination the lungs are found solid with effused blood, and microscopically the blood is found to fill the alveoli and bronchi so that the section looks almost homogeneous. The etiological factor in such cases is usually organismal, but there is some evidence to support the theory that it may occasionally be of the nature of an anaphylaxis.

Other Causes of Death.

Most of the other causes require little or no explanation. In one case the cause of death appeared to be liver necrosis following upon maternal eclampsia. Prematurity in itself accounts for a large number of neo-natal deaths. In such cases there is no lesion found to account for death which has occurred because of the undeveloped condition of its respiratory, thermogenetic, and digestive mechanism, rendering it unable to adapt itself to its new environment. In such cases the investigator must look farther back than the cause of death and seek the cause of the prematurity.

Prevention of Neo-natal Death.

From these investigations into stillbirth and neo-natal death one or two practical points have emerged with especial clearness:

1. The compulsory or voluntary notification of the pregnancy of every expectant mother, leading to its adequate supervision, should enormously reduce the present appalling infantile death rate from birth injuries and preventable infections.

2. The liability on the part of the newly born infant to infections of all kinds renders it advisable to take every precaution to guard it against such infections by the establishment of infant wards with special nurses for the care of the infants alone. Infants can scarcely be expected to escape infection if they are allowed to occupy cots in wards, possibly by the bedside of an infected mother, and to be handled by the mother's nurse.

3. The need is urgent for a fuller and more practical training of students in the art of obstetrics, and in this training a practical acquaintance with the methods of preventive midwifery should take a prominent place.

V.—SYPHILIS AS A CAUSE OF ANTE-NATAL DEATH.

BY

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THE following contribution to the study of the etiology of ante-natal and neo-natal death deals with the question of syphilis, and is an attempt to estimate the value of the Wassermann reaction in the newborn, the incidence of congenital syphilis, and the part played by the disease in the causation of ante-natal death. It is based upon the examination of the Wassermann reaction of over 3,500 specimens of maternal, placental, and infantile blood, and upon an analysis of the clinical records of 1,000 cases. All the material, which was entirely unselected, was obtained at the Glasgow Royal Maternity and Women's Hospital, and the Wassermann reactions were carried out by the writer in the research department of the hospital, Harrison's technique being employed.

Incidence of Syphilis in Mothers.

Without entering into a detailed discussion as to the significance of the Wassermann reaction in the adult, the generally accepted view as to its value is taken—that a positive reaction obtained in a patient known to be free from such tropical diseases as malaria, and such acute infections as scarlet fever, indicates the presence of active or latent syphilis, while in the great majority of cases a negative reaction excludes the presence of syphilis.

Realizing the extent to which the incidence of syphilis varies in different classes of the community, no attempt is made in the present investigation to estimate the prevalence of syphilis in the population generally, or to compare the incidence of the disease in the various social classes of the city. The writer's aim has been rather to demonstrate the extent to which one important section of the community is infected with syphilis, and to study the effects of the disease as a factor in the production of ante-natal death.

In a series of nearly 1,900 unselected cases a positive Wassermann reaction was found in a little over 9 per cent. of mothers, so that—accepting the view that figures based on the results of the Wassermann reaction tend rather to underestimate than to overestimate the actual incidence of the disease—it may be concluded that approximately 10 per cent. of women of the "hospital class" in Glasgow are, or have been, syphilitic. It may be noted in passing that the incidence rate of syphilis, as shown by the Wassermann reaction, was found to be under 9 per cent. in the married women, and over 11 per cent. in the unmarried women, in the series of cases examined.

Incidence of Syphilis in Infants.

Opinion at the present time is somewhat divided as to the value of the Wassermann reaction in the blood of infants and, more particularly, in the foetal blood as obtained from the placenta. Many workers appear to accept the presence of a positive reaction in the newborn as evidence of the presence of congenital syphilis. That the occurrence of a positive reaction at birth has such a significance was challenged by Fildes in 1915, and the chief conclusions which he then drew from a study of this point were—first, that a positive reaction in the infant at birth does not necessarily imply the presence of syphilis in the infant, but may simply be due to the passage of reacting substances from the mother's blood, and, secondly, that the Wassermann reaction in the blood of the newborn does not show any close agreement with that of the mother's blood.

In the present study the placental blood of 1,350 infants was examined, and the Wassermann reaction was found to be positive in just over 4½ per cent. In over 400 cases the blood of both the mother and the child was examined and it was found that the reaction was the same in both in nearly 95 per cent. of cases. These figures show a close agreement between the Wassermann reaction in the mother and in the child at birth, and the main differences which occurred were due to a tendency for a comparatively small number of the children of positive mothers to give a doubtful or negative reaction. On this point the results of the present investigation differ from those of Fildes.

There still remains for consideration the question of the interpretation of the results of the Wassermann test in the blood of the newborn. Is the occurrence of a positive reaction to be regarded as due simply to a transference of the mother's reacting substances to the foetal circulation, or is one justified in concluding that the presence of a positive or a negative Wassermann reaction in the blood of an infant at birth is a safe guide in determining whether the child is or is not syphilitic? With the object of settling this point a number of children with their mothers were re-examined at periods varying from three weeks to twenty months after birth. The result of this re-examination of infants agrees in the main with the conclusion drawn by Fildes, though certain points of difference are to be noted. The series consisted of 181 children and their mothers, and the following results were obtained:

1. In the series of cases examined all the children which at birth gave a negative Wassermann reaction continued to do so from ten to twenty months afterwards.

2. Of the children which at birth gave a positive reaction the great majority gave a clearly negative reaction when re-examined from three weeks to twenty months afterwards.

3. There was a small group of cases in which the mother's reaction was positive or doubtfully positive at the time of delivery, but subsequently became negative or doubtfully negative. In these cases the child was born with a negative or doubtful reaction, and when re-examined during the first year of life it was found to be negative.

The close agreement between the Wassermann reaction in the mother and in the child at birth, the persistence of a negative reaction in the cases where one was originally present, and the disappearance of a positive reaction in the majority of infants in whose blood such a reaction was obtained at birth, all point to the conclusion that the Wassermann reaction in the newborn is of little value in proving the presence of congenital syphilis. The appearances suggest that in most cases a positive reaction in the infant's blood at birth is due, as Fildes maintains, to the transference to the foetal blood of reacting substances derived from the mother.

From the above facts, as well as from the clinical examination of the infants included in the present series, it would appear that the incidence of congenital syphilis has been greatly exaggerated by most recent writers, and that the estimated incidence of under 1 per cent. given by many authorities, such as Still, Fruhinsholz, Cassell, and, more recently, by Fildes, is nearer the truth.

At the same time the question of latent syphilis has to be considered, and further observation is required to exclude the possibility of lues tarda developing.

The Effects of Syphilis on the Incidence of Abortion, Premature Birth, and Stillbirth.

The idea that a history of repeated stillbirths and abortions is a diagnostic sign of syphilitic infection of the mother has been handed down by tradition for so long that it has almost been accepted as an axiom. Of recent years, however, there has been a tendency to doubt whether syphilis is really such an important factor in the causation of abortion and stillbirth as formerly was supposed. For this reason an attempt has been made to estimate in the present study the part which syphilitic infection in the mother plays in the production of abortion, premature birth, and stillbirth.

* Working on behalf of the Medical Research Council.

In figures based on admissions to a maternity hospital, where the proportion of cases of delayed and complicated labour is enormously greater than the proportion of abnormal labours in the population generally, the incidence of stillbirth must be much too high, and in estimating the actual incidence of abortion from the records of such cases a similar difficulty arises. Making allowance for certain modifying factors, it will be admitted that statistics drawn from hospital admissions without selection of cases, while of little use as an indication of the actual incidence of abortion and stillbirth, are of value in estimating the relative incidence of abortion or stillbirth in syphilitic and non-syphilitic women of the "hospital class."

The results of the present study with regard to syphilis in the mother as a factor in the etiology of abortion, premature birth, and stillbirth are as follows:

1. *Abortion* (that is, pregnancy ending before the seventh lunar month).—There were 12.8 per cent. of abortions in a series of 1,000 pregnancies. In the group of cases in which the mother's Wassermann reaction was positive the incidence of abortion was 6.17 per cent., and in the group of cases in which the mother's Wassermann reaction was negative the incidence of abortion was 13.17 per cent. While there is thus, apparently, an incidence of abortion in the positive group equal to about half the incidence in the negative group, one cannot lay great stress on the point, for the number of positive cases in which abortion occurred forms too small a series for numerical comparison. The conclusion seems justified, however, that there was no greater incidence of abortion in the positive group than in the negative group.

2. *Stillbirth.*—In the 737 cases in the series in which a viable foetus was delivered the percentage of stillbirths was 16.46. The incidence of stillbirth in the positive group was 18.07 per cent., while in the negative group it was 15.15 per cent. From these figures it is seen that stillbirth occurred in the series with slightly greater frequency amongst syphilitic than amongst non-syphilitic women; and this, it is to be noted, was in a collection of cases containing an unusually high proportion of abnormal labours.

3. *Abortion and Stillbirth.*—Considering these two conditions as one group, it is seen that in the present series of cases abortion and stillbirth occurred with almost equal frequency in syphilitic and in non-syphilitic women. The greater incidence of abortion in the negative group as compared with the positive group has already been noted, but for the reasons given one cannot draw any more definite conclusion on this point than that abortion was not more frequent amongst syphilitic than amongst non-syphilitic women in the series.

The greater incidence of stillbirth in the positive group as compared with the negative group is remarkable, particularly when it is remembered how many of the cases showed obstetrical complications. Even without making allowance for this, and still more so if such allowance be made, it is clear that in the present series of cases stillbirth was distinctly more common in syphilitic than in non-syphilitic women.

4. *Premature Birth.*—The incidence of premature birth amongst the viable infants of mothers with a negative Wassermann reaction was 19.88 per cent., while the incidence of premature birth amongst the viable infants of mothers with a positive Wassermann reaction was as high as 32.54 per cent. These figures, based on the 737 cases of the series in which a viable infant was born, illustrate in a remarkable way the importance of syphilis as a cause of premature birth. The point is, however, emphasized by the fact that, of the 133 premature children born to mothers with a negative Wassermann reaction, 34.61 per cent. were stillborn, while of the 27 premature children born to mothers with a positive Wassermann reaction 68.75 per cent. were stillborn.

5. *Relation between Abortion, Premature Birth, and the Presence of Syphilis in the Mother.*—By taking the three conditions together—abortion, premature birth, and stillbirth—one is able to realize what I take to be the true significance of their relation to syphilis in the mother. It has been pointed out above, with reference to the present series of cases, that if abortion and stillbirth are grouped together the incidence of the combined group shows little difference in syphilitic as compared with non-syphilitic mothers (22.58 per cent. and 24.94 per cent. respectively). The incidence of stillbirth, taken by itself, has been shown to be somewhat greater in the syphilitic than in the non-syphilitic group in this series (18.07 per cent. and 15.15 per cent. respectively).

It is the analysis of the figures with regard to premature birth, however, which reveals the most important effect of syphilis in the production of ante-natal and neo-natal death. As has been noted above, 19.88 per cent. of the viable infants born to non-syphilitic mothers were premature, while of the viable infants of syphilitic mothers 32.54 per cent. were born prematurely. Of these premature infants 34.51 per cent. were stillborn in the non-syphilitic group and 68.75 per cent. were stillborn in the syphilitic group. It is, then, as a cause of premature birth and stillbirth that syphilis is of greatest importance in the later months of pregnancy.

Summary and Conclusions.

From a study based upon the Wassermann reaction of over 3,500 specimens of blood and upon the clinical records of 1,000 pregnant women it is concluded:

1. That between 9 and 10 per cent. of women of the "hospital class" in Glasgow show evidence of syphilitic infection.

2. That the results of the Wassermann reaction in the blood of the newborn are of little value in proving the presence of congenital syphilis.

3. That the incidence rate of congenital syphilis has been greatly exaggerated by most recent writers.

4. That syphilis in the mother cannot be shown to be a factor of predominating importance in the etiology of the interruptions of pregnancy in the earlier months.

5. That syphilis is one of the most important causes of stillbirth and of interruption of pregnancy in its later months, leading to premature birth, and, more particularly, to premature birth with death of the foetus.

VI.—PLACENTAL CHANGES IN RELATION TO FOETAL DEATH.

BY

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IN the course of examination of any large number of stillborn foetuses in order to ascertain the cause of death the condition of the placenta will in many cases be found of the utmost importance; indeed in a large proportion of cases but for a thorough examination of this organ the cause of death could not be discovered. In his recent monograph on the subject of foetal death Eardley Holland states: "No *post-mortem* examination of a foetus can be regarded as complete unless accompanied by the examination of the placenta and cord," and any worker in this line of research will surely agree with this dictum.

In cases of stillbirth associated with such conditions as, for instance, dystocia, placental changes of note are mostly absent; it is mainly in cases of syphilis, eclampsia, albuminuria, or death from unknown cause that placental changes will be found.

Such changes may usefully be classified under the following two headings:

1. *The Syphilitic Placenta.*

This is in some cases quite normal in appearance; this was the case in 3 out of 8 of our series. These 3 placentae were of normal size both absolutely and relatively to the foetus; the appearance and consistency were as seen in healthy specimens, and but for other clinical factors present there was nothing to indicate the presence of syphilis in the naked-eye appearance of the placentae. The other 5 syphilitic placentae were, however, large, soft, pale, and flabby, but no infarctions or haemorrhages were present. In these 5 cases an increase in thickness up to two inches was also present. It is to be emphasized that the three organs showing no naked-eye changes accompanied full-time foetuses, while in the other 5 cases the foetuses were premature—mostly about the thirtieth week.

Microscopically, in a well-marked case, the individual villi will be seen to be larger than normal and more closely packed, so that the field is thickly occupied by them; the stroma of the villi is thick and vessels are either absent or small and inconspicuous. Positive endarteritis was not often found and the appearance presented by the villi may be ascribed to a perivascular fibrosis which, in time, obliterates the vessels by pressure. While, in such specimens as appear normal to the naked eye, these microscopical changes are not well marked and, indeed, may at first sight appear to be absent, yet, if sections be taken from several different areas some degree (it may be slight) of these changes will be observed.

It would appear, then, that in cases where this overgrowth of the villi occurs early—presumably in the more severely infected cases—the degree of vascular obliteration will be such as to interfere with foetal nutrition and bring about premature death *in utero*, while in cases where this does not occur until later—in the less severely infected cases—the foetus may go on to full time and be stillborn or be born alive and die soon after birth when the placental interchange is cut off and the syphilitic poison confined to the body of the foetus.

2. *Placental Infarctions.*

Time will not permit a full discussion of this subject and the conclusions arrived at will require to be shortly stated.

In the series of stillbirths examined 46 placentae showed varying degrees of red or white infarctions; of these signs of old or recent, slight or severe utero-placental haemorrhage were present in 21 cases, or 45.5 per cent., while there was associated albuminuria in 26 cases (56.5 per cent.). The changes, both macroscopic and microscopic, in infarction formation have been worked out by several observers, notably by Eden, Whitridge Williams, and Young, and two main views are held as to their formation.

(*a*) Eden and Williams hold that the process consists of an ischaemia of a certain area of the placenta, consequent on endarteritis of the branches of the umbilical vessels, with their subsequent obliteration. This is followed by coagulation necrosis at the syncytial edge, which is accompanied by fibrin deposition, which fixes the involved villi together. The infarct finally consists of a number of more or less degenerate villi welded together by a mass of fibrin. This process forms one of the changes preparatory to the separation of the placenta. Infarction formation, according to this view, then, is a normal process, and constitutes a sign of senility in a short-lived organ. But it is not explained why such changes occur only in patches; also the factors which focus the process on any particular part or parts of a placenta have, so far as is known, not been investigated. Such a process as described undoubtedly does occur, but the resulting infarcts are small and white from the outset, and, so far as could be judged, have been excluded from our present consideration.

(*b*) Young's view is that as the result of utero-placental haemorrhage an acute vascular injury is inflicted on that portion of the placenta related to the haemorrhage. This produces passive congestion, accompanied by dilatation of the vessels in that part, and this may be so extreme that rupture of the capillaries may occur, causing an intraplacental bleeding, which may again be localized, or to a greater or less degree infiltrating.

Such a coagulum later on shows an encircling white capsule or line of demarcation which increases in thickness until only a small central clot or later only a brown stain is left in this whitish, laminated area; and finally that also disappears, the haemorrhage now having become entirely replaced by a whitish, hard area which is, in effect, a fibrinous scar at the site of the original haemorrhage.

Such infarcts are white only in the later stages, are larger than those previously described, and are often accompanied by signs of retroplacental clot; further, while those in the previous c'ass do not appear before the twenty-eighth week of gestation, the variety now under consideration may be found well developed much earlier. Stillbirth is brought about in these cases by the ablation of an area of the placenta sufficiently extensive to interfere with foetal nourishment. If we accept Young's views regarding the absorption of toxic products from such devitalized areas into the maternal circulation to set up albuminuria or eclampsia, it is equally feasible that a similar absorption will occur into the foetal circulation and produce toxic death there.

From these considerations it may be inferred that, should the uterus empty its contents immediately after the occurrence of such utero-placental haemorrhage, the foetus will not be macerated and the placental changes will not, as yet, have had time to develop, so that this organ, in such cases, may appear to the naked eye practically normal although microscopical examination will reveal the presence of vascular dilatation; while, if the uterine contents are retained for a time, maceration of the foetus will have occurred and placental infarctions will have developed before expulsion. Experience has confirmed these expectations, and in this class of case a macerated foetus is usually accompanied by an extensively infarcted placenta.

Relative insufficiency of the placenta requires little more than mention; it is a rare condition, having been met with by us only once in 150 cases examined. In this case the foetus was expelled at thirty-two weeks without obvious cause, being normal in appearance and structure, but the placenta was very small, weighing only 6 oz. (169 grams). Its microscopic structure was normal. The condition is brought about by an overatrophy of the chorionic villi, so that at a certain time sufficient nourishment cannot be absorbed to supply the foetus, which then dies and is expelled.

From these observations it will be gathered that placental lesions constitute an important variety of the conditions causative of or associated with stillbirth; at the risk of too great reiteration it has to be repeated that examination of the placenta of every case is very necessary in all stillbirth investigations.

DISCUSSION.

Dr. T. W. EDEN (London) said that he felt completely overwhelmed by the mass of facts which had been presented to them by the various speakers, and he would need time to digest them; but one thing was quite certain, and that was that their midwifery practice wanted improving. That meant improved teaching, and this was more a question of organization rather than anything else. Improvement was called for (1) in the conduct of labour itself and (2) in the supervision of the pregnant woman. They had heard a good deal lately of the similarity of labour to a surgical operation. If that meant that the strictest possible asepsis should be preserved that was correct, but it was a dangerous fallacy to look upon labour as an opportunity for the exhibition of manual dexterity and skill. With regard to ante-natal clinics, he could not imagine anyone more unfitted for their management than the medical officers of health. As a rule they were the least qualified for this work; unless supervision was not only conscientious but well informed, such clinics were useless.

Dr. LAPTHORN SMITH (London) expressed his pleasure at hearing the papers read that morning. As regards toxaemia his experience of 2,500 confinements was as follows: (*a*) Toxaemias up to the seventh month were entirely preventable if seen early. (*b*) If not seen till after the seventh month prompt treatment of the mother was necessary, and if convulsions came on removal of the foetus as quickly as possible by the means least injurious to the mother, generally by Caesarean section. (*c*) The accepted teaching should be changed that version was a good procedure for delivery in difficult labour. He thought that version was very dangerous for the child—this was well known. He agreed with previous speakers that the danger did not come from pressure on the cord so often as it did from rupture of veins and membranes by the force of traction on the aftercoming head. (*d*) The foetus was liable to all the diseases to which the mother was liable. (*e*) If every practitioner were to teach his prospective cases of confinement that they must be under supervision during the whole of their pregnancy, if he made it his business to cure constipation and other causes of absorption of toxins from the digestive tract, and if he taught the women to drink more water and eat less meat there would be very few cases of uraemic convulsions which cause so many pre-natal deaths and quite a few post-natal deaths. (*f*) Craniotomy should disappear from practical obstetrics.

Dr. RUSSELL ANDREWS (London) agreed that ante-natal beds in hospital were absolutely essential, but he thought they would be extremely difficult to get. When obtained they must be kept for this purpose strictly. The suggestion that a Commission should be appointed was extremely important. Referring to the matter of breech delivery, he thought it was essential to obtain full dilatation of the cervix before attempting delivery. Stillbirth was much more likely where the head was delayed high up by a not fully dilated cervix than in cases where delay was caused by the perineum.

Dr. ANDERSON (Glasgow) put forward the view of the general practitioner. He would take to heart the advice given about delivery of the aftercoming head. He was greatly interested in the question of the toxaemias, as it would appear that a very large number of cases had occurred of recent months in Glasgow, possibly connected with the epidemic of influenza. He wished for advice from the leaders of the profession as patients continued to show the greatest possible

reluctance to any form of *ante-partum* examination. When it was urged by the doctor they were very apt to accuse him of going out of his way to gain fees. On account of this prejudice it was a very difficult matter for the general practitioner to carry out these recommendations.

Professor MUNRO KERR (Glasgow) agreed with previous speakers that deaths during parturition represented from 55 to 60 per cent. of all foetal deaths. Referring to the delivery of the after-coming head in cases of breech presentation he said that the trouble could be absolutely avoided by version in the later weeks of pregnancy, cranial presentation being thus secured. He thought the application of forceps to the after-coming head was extremely valuable (1) because traction was made directly on the head, (2) a better flexion of the head could be secured, and (3) extraction could be made much more slowly owing to the admittance of air which took place when the instruments were applied.

Professor R. C. JOHNSTONE (Belfast) thought that Schulze's method of artificial respiration was responsible for many foetal deaths.

Dr. STEWART (Glasgow), speaking as a worker in an ante-natal clinic, asked for a much closer co-operation between the leaders of the profession and their humbler colleagues. She was of opinion that it was extremely difficult to get patients to come for examination, but they lured them to the ante-natal clinics by sociological methods. She thought that for a generation or two women would not go to their doctors until they were actually ill. Their great difficulty in the ante-natal clinics was to get proper support; she feared that in some towns, at any rate, these clinics were not appreciated.

The PRESIDENT, continuing the discussion, said that it was generally conceded that the general practitioner was the person most responsible for unnecessary interference in labour—but was the consultant entirely without blame? Consultants were usually called in to do something to finish matters; they were expected to do something, and were not so much treating the case as helping the whole household to get it over—everyone was anxious for labour to be completed. Consultants must realize that they had to bear their share of the responsibility. The only remedy was to make the public appreciate that interference was, more often than not, for the good of neither mother nor child. In regard to version in breech cases he thought a reservation must be made, as at times delivery by the breech was best for both mother and child. In regard to the relation of the medical officers of health to the ante-natal clinics, in centres other than teaching centres, he was of opinion that they were the proper persons to administer them; they had the organization. He would be sorry for any strictures on medical officers of health to go out as the considered opinion of that meeting. Everything tending to encourage the advancement of our knowledge of ante-natal work should be encouraged.

Dr. BALLANTYNE, in closing the discussion, referred to the great pleasure it gave him to be in an atmosphere where the subject was sympathetically received. It was no longer to be regarded as a fad, a wild dream of futurity. As regards the position of the medical officer of health, he described how he had been consulted at every stage in working out the scheme in Edinburgh, and he thought that it was essential for them to keep in touch with the medical officers of health as a connecting link. He remarked that version in breech cases was not always easily performed even under anaesthesia, and suggested that sometimes the employment of pads and a tight binder might prove useful.

Resolution by the Section.

At the conclusion of the discussion on ante-natal and neo-natal deaths the following resolution was passed:

"The Section of Obstetrics and Gynaecology (1922) of the British Medical Association is of opinion that every expectant mother and her unborn infant should receive efficient and adequate ante-natal supervision and (if needed) treatment, either from doctors in practice or in maternity hospitals and homes; and, with this end in view, recommends the Council to set up a provisional committee, consisting of representatives of the obstetrical societies and of the health authorities of Great Britain and Ireland, to confer as to the formation of a scheme for securing foetal welfare and preventing foetal mortality."

TREATMENT OF INFANTILE PARALYSIS IN CHILDREN.*

BY

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THE President of the Section for the Study of Disease in Children, Sir Robert Jones, recently delivered to it an address on the treatment of paralysis in children, and it occurred to me that a practical demonstration of the methods by which the principles he described are carried out in the Wingfield Hospital, Oxford, and its surrounding clinics would be a useful addendum to his remarks.

I think that the subject is one of great clinical interest, but there is one side of it to which I would like to draw special attention—that is, the political economy of the treatment of these paralytic cases. The Education Act of 1918 has added greatly to the responsibilities of local authorities with regard to crippled children, and at the same time special attention is being devoted to these cases by surgeons in many parts of the country. The education authorities are helping to finance the treatment of these cases, and it is probable that they will look closely into the expenses to which they are thus committed, in relation to the results which are finally obtained.

We have to prove the economy and efficiency of our treatment. While it is vital that the principles of treatment shall be carried into effect, we should aim at using simple appliances, for simplicity means economy, both in first cost and in maintenance. My fear is that, in some places, the authorities, after a period of tentative generosity, may become dismayed at the cost of providing, repairing, and renewing apparatus, and disappointed with the results of their expenditure, and so limit their financial help and organized co-operation in this work.

FIRST STAGE.

Probably far more good can be done by treatment during the early hours and days of the attack than at any subsequent period. While quarantine is certainly advisable, and serum may prove helpful, the indications for orthopaedic treatment during the first few hours and days after the onset are urgent. We have to deal with acute anterior poliomyelitis—the anterior horn cells are inflamed and poisoned. They need absolute rest. The shocks they receive from any reflex or central stimulation must definitely prejudice their chances of passing through the acute stage without destruction or permanent damage. This is the plainest pathological truth. Its practical application, then, is that we must keep the patient at rest in comfort and warmth. There must be no restlessness of mind or body, and no exposure of the skin to sensory stimulation. At the same time we have to consider the additional factor of the prevention of deformity and the posturization of muscles.

To carry out these principles in practice, we wrap the child completely and comfortably in cotton-wool or gamgee tissue and place him on a Thomas's double spinal frame with headpiece, on a soft saddle, with the feet at right angles on footpieces, and the pelvis true. If the arms are affected they are held abducted with the elbows flexed. The child quickly settles into comfort and tranquillity. Rest of the spinal ganglia is achieved. In this form of protection, warmth, and splintage the patient can be looked after without any disturbance, for he is lifted as a whole on the frame for nursing purposes.

The child is kept thus immobilized for at least six weeks, and much longer in serious cases. After all tenderness is gone light massage without movement is begun. In some cases we put the legs below the knee in plaster over very thick wool padding, so as to keep the feet at right angles without allowing them to become flattened and abducted. The position of the anterior superior spines is verified frequently to make sure that the pelvis remains true; for a tilted pelvis is an insidious evil, and one which tends to initiate or exaggerate serious later deformities such as scoliosis.

SECOND STAGE.

The first stage passes almost imperceptibly into the second stage, and we find that the principles of treatment to be adopted in the second stage must be applied carefully and

* Read before the Section for the Study of Disease in Children, Royal Society of Medicine, July 1st, 1922.

tentatively. Sir Robert Jones stated in his address "that every case represents a separate anatomical problem." This is profoundly true, and one may well add that the treatment of a serious case requires careful reconsideration from week to week.

The principles we work on are:

1. Posturization of the trunk and limbs.
2. Correction of deformities, if any have developed.
3. Resumption of function of the ganglion cell and affected part, induced by (*a*) skin stimulation by light massage, (*b*) re education and commencement of active movements, and (*c*) locomotion without overstrain.

We apply these principles in practice carefully and in the order in which I have stated them.

1. *Posturization.*

The chosen posture depends upon: (*a*) The distribution of the paralysis, and (*b*) the need for safeguarding "key" muscles. In connexion with the former we protect the weak or paralysed muscles from being overstrained by their stronger opponents.

[Children illustrating the application of this principle by plaster, celluloid, and double side-irons with fixed sockets, were shown.]

We have learned to be specially careful to favour and protect certain "key" muscles. We recognize that certain muscles have dominant value in the function of both upper and lower limbs. In the upper limb these are the deltoid and the median thenar intrinsics; in the lower limb the glutei and the quadriceps.

In the upper limb, unfortunately, the deltoid and the median thenar intrinsics are the muscles most commonly paralysed and most easily overstretched. In the upper limb, then, abduction of the arm and abduction and opposition of the thumb are specially cared for, the former by an abduction splint or plaster [cases were shown in arm abduction splint], the latter usually with a small plaster "cock-up" holding the first metacarpal in relation to the rest of the hand as if it were holding a glass.

In the lower limb, on the other hand, the glutei are less frequently permanently paralysed, although the maximus is often overstretched. Until the strength of this muscle is assured, or its recovery despaired of, our aim is to prevent flexion of the hip by a plaster or celluloid splint. The quadriceps is commonly paralysed, and frequently overstretched. In the common sitting position both gluteus maximus and quadriceps are overstretched. We protect the quadriceps by a walking calliper splint.

[Ten children were shown walking in callipers for one or both legs. Three of these were old cases which had been given up as incurably bedridden.]

If there is paralysis or weakness of dorsiflexion or plantiflexion of the ankle we keep the feet at right angles by fixed callipers, or double side-irons, or in plaster or celluloid. In the latter case a large boot is worn over the splint and the round calliper ends are fitted into its heel. [Examples were shown.]

During the whole of the second stage, which may last for years, we never use any hinged apparatus. The simple abduction arm splint costing 15s.,* the walking calliper at £1 5s., and the double side-irons at £1, with plaster, and an occasional celluloid, satisfy the needs of the limbs.

For children with weak trunk muscles, without any actual deformity, we find it useful to supply a light spinal support. Indeed, some of our cases with very extensive paralysis, whose condition was thought hopeless, walk about with two callipers and a light spinal support. They manage to get about on their legs, and, what is extremely important, to go to school. Meanwhile the principles of posturization are being realized. Considerable muscle recovery has occurred in some of these cases. Sometimes we attach straps from the spinal support to the back of the calliper to limit the flexion of the hip where the gluteus maximus is weak, or to prevent internal or external rotation of the whole lower limb.

2. *Correction of Deformity.*

This is carried on in the second stage after all tenderness is over. Unfortunately many cases only reach our hospital or clinics well on in the second stage, and after deformities have developed. The correction is usually done gradually by repeated plasters. The only operation that is at all commonly performed is Soutter's operation for severe flexion deformity of the hip.

Scoliosis.—Extreme difficulty is often raised by late cases with severe scoliosis. Lovett is emphatic in his warning as to the care that is to be taken in preventing scoliosis by the recognition of unilateral paralysis or paresis of the abdominal muscles. Other trunk muscles, of course, have their share in the causation of paralytic scoliosis. While with care much of this deformity can be prevented, once severe paralytic scoliosis has developed I do not think it is right to attempt full correction. It is so easy to do much more harm than good by corrective plaster or apparatus. One must never forget that the life of these semi-paralysed children depends on their "vital capacity," and that any corrective or retentive pressure may limit the comparatively feeble movements of respiration they possess. In applying apparatus, therefore, we are very careful to leave the respiratory movements unhampered as far as we possibly can. We endeavour to erect the trunk true on the pelvis, and we find the Murk Jansen method, by his first stage plaster-bed, and his second stage light support, helpful in many of these cases.

[A child was shown lying on her Murk Jansen plaster-bed, then up in the (adapted) second stage light support. She had had a very severe scoliosis in association with extensive paralysis. Treatment by these methods had proved most successful.]

3. *Resumption of Function.*

The time comes when the ganglion cell must be induced to start work again. Usually the return of voluntary movement is automatic and needs no special help, but where no contraction is seen to occur in a muscle which has been kept in a relaxed position for some months we begin to stimulate the ganglion cell. This we do gradually and tentatively, both through reflex paths by gentle skin stimulation and through the central nervous mechanism by re-education.

When locomotion is to be recommenced the greatest care and watchfulness are necessary. It is probably true to say that there is a universal natural law that any living tissue responds to the stimulus of strain by growing stronger, but to the excessive stimulation of overstrain by wasting and weakening. Every tissue must have its own threshold between strain and overstrain. For muscles and ligaments this law is constantly at work, and when we have to deal with a partially paralysed muscle we are careful to prevent overstrain.

Lovett[1] makes it clear that partial paralysis of a lower limb sometimes passes into complete paralysis during the late second stage, due to overstrain in locomotion. He describes this condition chiefly with regard to the gastrocnemius. We have found the same tendency commonly at work in connexion with the quadriceps, though we have been able to prevent actual paralysis supervening, except in one case which was temporarily lost sight of. It is our practice, as I have already described, to keep the feet at right angles and the quadriceps protected by a calliper until Mackenzie's final test is fully satisfied. But even after this we find that the calliper has to be left off tentatively, and frequently have to put the patient back into the calliper for several months owing to a progressive return of the quadriceps weakness.

Third Stage.

The second stage passes into the third stage when posturization followed by attempted resumption of function has distinguished the muscles that are recoverable and those that are permanently paralysed.

In the third stage our principles are further to develop the patient's capabilities, whether by stabilization of joint, transplantation of tendons, etc., or suitable appliances; but we postpone operations such as arthrodesis, until after the age of 8 or 10, and keep the patients with flail knees walking in callipers until after their school life is finished.

[Cases were shown illustrating arthrodesis and tendo Achillis reinforcement.]

After-care Centres.

In the very scattered agricultural district which the counties of Oxfordshire, Berkshire, and Buckinghamshire constitute the problem of the prolonged supervision of these cases is very different from that in a town and much more difficult. It is impossible to expect the children to come up regularly long distances to the hospital. We have got over that difficulty by instituting local orthopaedic clinics in various market towns through the area. It is necessary to carry the out-patient department of the hospital to the patient's own district.

[Two new cases were shown to demonstrate the typical complex deformities, the methods of examination, and an outline of the programme of treatment.]

*All our splints and appliances are made in the hospital workshops.

As you will have seen, we try to work on simple and economical lines. The apparatus is comparatively cheap, straightforward, does not require difficult measurements or repeated fittings, and lasts for a long time, as there are no fragile or complicated joints. The appliances enable the children to walk, and at the same time carry out the twin principles of posturization and avoidance of overstrain.

I feel that methods such as these go far towards realizing our dual aims of economy and efficacy, but doubtless there are many ways in which our methods could be improved, and I hope that the subject will be widely discussed, because I feel that its importance is great and that full knowledge of the most practical methods should be widely disseminated.

REFERENCE.

[1] *After-Care of Poliomyelitis in New York State.* New York State Department of Health.

ACUTE INTESTINAL OBSTRUCTION.

BY

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THIS essay has been written with the intention of inviting surgeons to take stock of present methods of dealing with the most grave acute problem in general surgery, and if any of the suggestions herein contained should prove of value in helping to diminish the incidence of acute obstruction of the bowels or in enhancing the chances of surgical relief the time and thought devoted to its composition will be more than recompensed.

Adopting the motto, "Avoid the abstract and stick to the practical," I commence by putting the question: What is to be done in case of acute obstruction when a portion of the gut is found gangrenous? Before responding, one has to bear in mind that, from the moment the circulation of the bowel becomes impeded, splanchnic shock and systemic poisoning begin, and both intensify in compound ratio to the hours which pass until the obstruction is relieved. General symptoms often prove delusive guides as to the existence of this lethal combination, which seems temporarily to possess an insidious potentiality only requiring some slight surgical stimulation to unveil its effect with appalling rapidity. Whenever gangrene of intestine is met with, not only is it proof positive that the case has, for one cause or another, been sadly neglected, but there exist initial factors, poison and shock, which seriously handicap any attempt at human succour. While primary knowledge of these unpropitious facts may tend in a way to alleviate the sense of dire responsibility which everyone feels when he finds himself confronted with this tragic affection, yet it in no way deflects from the duty to spurn finesse and, even at the risk of the "dead stymie," ileus complete, to give every patient not absolutely moribund a surgical chance. Conscientious work accomplished in the shortest time[1] is the one thing most likely to snatch a victory, the masterstroke being elimination of the morbid trio—eventration, undue manipulation, and prolonged anaesthesia.

With this preface I will endeavour to give a reply to the above question: Concentrate attention on the extent of the gangrene, carefully scrutinize the condition of the mesenteric zone, confine the attack to what is essential, and, as every moment counts, "force the game."

I do not hesitate to state that, next to having details of likely operations in clear mental perspective, there is nothing more conducive to operative celerity than, while the patient is being prepared (always including gastric lavage), personally to superintend the selection of instruments and drains, the threading of an adequate assortment of needles, the provision of an ample (counted) supply of sponges, towels, and some rubber tissue. A few sterilized kidney basins must not be omitted, and the apparatus must be ready for any washing or injection which may be required, the operating table warmed up, and last, and indeed not least, the help of two smart assistants must be secured.

There is also a contingency which may seriously interfere with expeditious surgery in acute intestinal obstruction. Assuming previous examination fails to give an indication, a very perplexing question arises at the start—where to make the incision so as to get directly at the seat of mischief. I cannot conceive anything more demoralizing to a surgeon than, when entering the abdomen on a forlorn mission, to find his energy and time sapped, at the outset, in struggling to restrain inflated intestine from bursting out through the parietal wound. If the site of lesion is not evident—and, as frequently happens, the distension is so great and the serous coat of bowels so friable that it is impossible to pass the gut methodically through the fingers in search for the constriction without causing numerous peritoneal lacerations—his position is truly pathetic, between the Scylla of traumatism *plus* exposure and the Charybdis of retreating without having reached the objective.

These remarks are not penned on hearsay but on dire personal experience, which incited me to publish a note in the BRITISH MEDICAL JOURNAL, November 23rd, 1918 (p. 573), on the necessity of instituting careful inquiry in every case of intestinal obstruction as to a previous attack of appendicitis, or to an abdominal operation in which the appendix might have been removed for convenience; and I urged that regardless of the time which may have elapsed (detailed revision of the patient failing to point a path) a three-inch incision should be made in the right semilunar line low enough to expose the ileo-caecal region and right pelvis where the distal ileum will usually be found implicated in adhesions. While my experience may be exceptional, it suggests the personal conclusion that, excluding the era of iodine skin disinfection and those which can be located before operation, in the majority of cases the obstruction of the small intestine will be encountered adjacent to the right pelvic brim, and that the stereotyped central incision in such instances courts disaster, as in the search for the lesion the distended semi-paralysed intestines are subjected to needless exposure and manipulation.

It is not pertinent to the context to analyse the psychology which inspires postponement of operation[2] in acute appendicitis until what is academically styled "the cold stage" supervenes further than to interpolate that patients so treated who escape immediate translation to the glacial state remain endowed with a nest of adhesions[3] which renders them likely candidates for premature mortification by the peristaltic contortions of their own small gut. And I must add that I am unable to comprehend the mentation which complacently admits of "We'll wait until to-morrow to decide" in a case of suspected acute intestinal obstruction.

Acute Obstruction of Small Intestine.

In a number of instances in which stoppage is suddenly caused by a band or kink only a narrow ring or small knuckle of bowel is found gangrenous, and in quite a proportion of these necrosis does not extend to the fixed portion of the gut, much less to the mesentery; the fact of the circulation in the heart of the intestine remaining intact induces a hope that there might be prompt restoration of peristalsis in the tube if inclusion or excision of the moribund area could be effected without entailing subsequent obstruction by diaphragm or angulation. Acting on this hypothesis, I venture to submit a classification from the operative angle, and I trust the suggestion will be viewed merely as a humble attempt to find some means of reducing the terrible mortality—40 per cent.—which attends surgical intervention as expressed in mediate or immediate enterectomy.

A.

In cases in which one finds that a complete circle of the bowel is beyond redemption I recommend that lateral anastomosis and excision of the gangrenous gut be carried out in the following order of detail:

1. The affected zone of intestine is drawn out through the external wound, extruding a sufficiency, above and below, so as to facilitate the performance of lateral anastomosis at a convenient distance from the lesion.
2. The protruded bowel is fixed *in situ* by sponges, which are meticulously packed into the wound so as to preclude any possible regurgitation into the peritoneal cavity during subsequent manœuvres.
3. Coils of proximal and distal healthy bowel are approximated and held in apposition by an assistant while four Triollet catgut Lembert sutures, half an inch apart, baste the apposed loops together; each stay is tied when inserted and its free ends caught in a pressure forceps.
4. An opening, by sharp scalpel, two inches in length, is then made, close to and parallel with the line of stays, into the distal gut—as no clamps are employed a kidney basin is made to catch whatever escapes—and then a pressure forceps is applied about the centre of the free edge of the incision to act subsequently as a tractor. With a large kidney basin in position a corresponding incision is at once made into the proximal bowel, free vent is afforded for escape of contents (the more the better omen), and the centre of the free edge of this wound is similarly seized with a forceps.

5. Two assistants then make gentle opposing traction on adjoining stays, while a continuous through-and-through Triollet catgut suture (tautly secured to each stay in transit) seals the posterior segment; the ends of the "central" stays are then cut short. The forceps previously attached to the free edges of wounds are now grasped by an assistant so as to indicate a strategic site for the insertion of two anterior "central" stays; the continuous catgut through-and-through suture is then carried on (as it approaches each stay the latter is tied and continuous suture knotted to it) until closure of the anterior segment is completed; the ends of stays are then snipped away and the whole field is washed with warm peroxide lotion, dried with bibules, and the anastomosed part is enveloped in a dry towel.

6. The gangrenous portion is then taken in hand; a catgut ligature is applied at least two inches respectively above and below the proximal and distal suspect limits, the intervening necrosed intestine is excised, and any bleeding point in the mesentery is immediately dealt with. A purse-string catgut Lembert suture is next inserted around the base of each intestinal stump; with a few snips of a scissors each stump is then freed from its mesentery just enough to render it easy for an assistant to invert it, with a dissecting forceps, into its corresponding lumen as the purse-string is being tied.

7. A jug of warm peroxide lotion (1 in 35) is again requisitioned; a general wash and brush up follows; everything is thoroughly dried, and the bowel returned. Four or five through-and-through strong silk sutures close the parietal wound, leaving room at one angle for passage of two thick silkworm-gut wisps, which are so placed as not to adhere to any line of intestinal suture.

B.

In some cases an incomplete narrow ring of gangrene results from constriction by a band, which in width more or less corresponds to that of the band itself; if this does not exceed 1 cm. and the mesenteric zone is healthy, the affected coil is drawn out through the wound and secured in place as before mentioned. Four equidistant long catgut Lembert stay sutures are then passed—skipping over the dead zone—through living proximal and distal gut; these sutures are not for the moment tied—their ends are respectively caught in forceps, and the assistants with blunt hooks retract the loops of these stays well out of the way, while a kidney basin is placed in position and a transverse incision made through the whole extent of the gangrenous area (*N.B.*—This incision is only made in cases where, after removal of the "external" obstruction, there is no consequent visible inflation of the distal bowel); thus free escape for contents is provided. When the flow ceases the hooks are removed from loops, the forceps grasped, and upper and lower intestine approximated. The stays are then tied and a forceps applied to each pair of free ends with which the assistants make opposing traction, while a continuous catgut Lembert suture, braced to each stay as it passes, completes the matter; the ends of stays being clipped away, the toilet, etc., is effected as in A.

C.

The most difficult case for decision is the one in which a band, kink, or twist has caused more extensive necrosis, the fixed portion of gut remaining suspect, and the mesentery apparently uninvolved. The problem then arises, can infolding or excision of gangrenous section be accomplished without leaving an obstructive diaphragm or angulation? In order to clear the perspective I wish here to mention that I cannot as yet recommend the adoption of either if the belt of gangrene exceeds a width of one inch; anything above that commands the major procedure A, but within this limit the complications mentioned can be obviated.

Three long catgut Lembert stays are inserted, as above, into the proximal and distal bowel, one along the free border and one on each side midway between this anterior stay and the mesenteric attachment. Blunt hooks are then made to pick up the loops and retain them clear of the field while a free crucial incision is made through the moribund segment. When the intestinal discharge has ceased, the loops of stays being still held aside, the four gangrenous flaps (made by crucial incision) are liberally excised with scissors. The stays are then drawn taut so as to facilitate inspection of the amount of angulation produced by approximation of the proximal and distal gut. Two similar lateral stays are next inserted close to the mesenteric line, embracing as much or as little of the peritoneal coat, above and below, as may be judged necessary to correct any likely kinking by the anterior sutures. The five stays are then tied and a continuous catgut Lembert suture applied as in B.

The part stays[1] take in the above procedures possibly warrants a little amplification. From beginning to end they make for rapidity and good workmanship, in that they point the line for the continuous suture, help to secure its tension, and in themselves form a strong second line of defence. They are infinitely preferable to clamps, as they do not cause any devitalization of tissue, which, by the way, in acute intestinal obstruction is already sorely attenuated by distension and toxic infiltration. They possess a sound surgical attribute—namely, they admit of the operator seeing a bleeding vessel and tying it. They serve as excellent pliable tractors by which the operator can dominate at will the slippy-sloppy ground on which he has got to work, and consequently are the best insurance against an attack of "the tail wagging the dog" at a moment when one carries a heavy time handicap in a race for life in the most fatal of acute surgical affections.

Acute Colic Obstruction.

In this catastrophe, if the problem as to the seat of lesion is not solved before operation, it may be taken for granted that what was mentioned as a contingent complication in acute intestinal obstruction is a certain one in advanced colic obstruction, and, owing to the enormous distension associated with the latter, surgical intervention as often as not ends in a tragedy. After a certain amount of prolonged pressure and manipulation necessary to retain intestinal balloons inside the abdomen, a rather sudden and unexpected relaxation of tension occurs, which is apt to lure one on to proceed instead of beating a rapid retreat, but which in reality is the culminating exposition of intestinal paralysis induced by the superaddition of traumatic to pre-existing splanchnic shock. The curtain then drops as the anaesthetist whispers the epilogue—myocardial liquidation has begun.

Under such circumstances it is natural that one should seek for some mode of escape before the advent of the fatal loss of spring, and I cannot see anything promising on the horizon except, in all cases in which thorough examination and careful study of the history fail to give a clue to the whereabouts of the obstruction, to make a right semilunar incision, explore gently for a few minutes, and if there is no result proceed at once with the preliminary step of closing the wound by inserting four or five long through-and-through strong silk sutures, and without knotting catch the ends of each in a pressure forceps. Then coax the left hand, supinated and extended, between the parietal peritoneum and the bowels over to the right iliac fossa, where two fingers flexed forward point the site for an incision large enough to allow the external inferior sacculation of the caecum to be drawn outside and maintained there momentarily by forceps. The semilunar wound is then rapidly closed, and a dressing applied, covered by rubber tissue and a towel, and immobilized by fixation forceps.

Attention is then turned to suturing the exposed caecal sac to the margin of the iliac wound in such a manner as to preclude any subsequent backward percolation. The patient is then gently rolled over on his right side to the edge of the table, a basin is placed in position, and a stab made into the gut sufficiently large to give free vent to its contents. I have had gratifying results with this method, and whenever feasible I like to employ the external inferior sacculation for drainage; as its site is strategic, it seems anatomically adapted for the purpose, it occasionally closes spontaneously after the obstruction disappears, and it can be closed by operation without encroaching unduly on the lumen of the caecum.

The early insertion of the through-and-through silk closure sutures may require some explanation. These sutures, in place, help to prevent a rush from within, as the wound can be promptly occluded by traction on the forceps and thus diminish pernicious handling of bowels. They afford good support for any temporary packing, and their presence tends to obviate separation of layers of parietal wall during operation. Owing to internal pressure their introduction may be an arduous business, which, to save valuable time, had better be effected before the fatigue stage supervenes; and the fact of their being in affords a comfortable homeward-bound feeling, which on occasion is not to be despised. If long threads of silk are used the loops can be readily hooked away from the field so as not to cause any operative inconvenience.

It may have been observed that I advocate an incision in the right semilunar line for both acute colic and acute "intestinal" (unplaced) obstruction, the reason for doing so being that 70 per cent. of acute abdominal lesions are credited to appendicitis. If to this be added the incidence of pyloric, duodenal, and biliary affections, the ratio of involvement of the right as compared with the left abdomen must certainly stand not less than 6 to 1; and knowing that the most frequent cause of obstruction is the legacy peritoneal agglutination following infective processes and operations for their relief, the deduction is, to say the least, logical

that, given no direct guide, the chances are greatly in favour of finding the lesion in the right abdomen. And as to the systematic search for obstruction by passing the gut through one's fingers, my experience dictates that this can be (when serous coat permits) as effectively done through a right semilunar as through any other incision. As to making a separate suitable opening in the right iliac fossa for caecal drainage, I am all in favour of it, for it appreciably diminishes the risk of subsequent virulent infection and its consequences in the large primary wound.

Peritoneal Seclusion of Stumps.

In 1903 I received my first object-lesson as to the danger of leaving raw endothelial stumps in the peritoneal cavity, in the case of a young lady on whom I performed double oöphorectomy for cystic disease, and as the appendix was very much in evidence I thought it expedient to remove it. This was done by a method in vogue at that period—namely, ligation and touching the stump with a disinfectant. As there were no adhesions, the whole operation was simplicity itself. Ten days later she suddenly developed acute intestinal obstruction; the wound, under anaesthesia, was opened up, and to my intense disgust I found the stump of the appendix glued to that of the right ovary with a coil of congested ileum clutched in the adhesion. An uneventful convalescence ensued. Since then appendical stumps have, when possible, been buried in the caecal wall or covered with an omental plaster.

The most recent reminder occurred in a married lady on whom I performed right oöphorectomy in October, 1920. As customary, the appendix, for "insurance" reasons, was also removed, and the stump interred. On June 3rd, 1921, she was suddenly seized with violent abdominal pain and vomiting, which her doctor attributed to "acute gastritis"; various enemas and purgatives were ineffectually administered during the following four days. She was brought into hospital on the morning of the fifth day: the abdomen was distended and porraceous vomiting incessant. There were no general symptoms beyond a distressed facial expression. A test enema was at once given, but without result, and as soon as the stomach was delivered of a basinful of dark green foul liquid she was transferred to the operating table. As parietal vaginal and rectal examinations gave no indication, I made the usual right semilunar incision. Immediately some coils of distended congested ileum bobbed up in the wound, which were returned by bibule pressure; the left hand was then introduced into the right pelvis, where it found a loop of ileum bound down, after the manner of a Christmas cracker, by a tense band about 1 cm. in breadth and 10 cm. in length, passing from below the caecum to the base of the right broad ligament. The left index finger was gently insinuated beneath the band and the strictured gut, and the former elevated (without rupture) for inspection. Then we found the silk ligature, which had been placed nine months previously on the meso-appendix, snugly encircling the band about half an inch from its upper point of fixation, affording a direct and positive proof that the band had originated in and included the stump of the meso-appendix. A small caecal scar indicated the tomb of the appendix; the right ovarian stump was free and had contracted to the size of a pea. The band was excised and the gut drawn up into the wound; a belt of gangrene, corresponding to the width of the band, involved the greater part of the free zone of bowel. Stays were inserted, and as peristalsis had visibly resumed its function the necrotic segment was infolded (without incision) by stays and a continuous Lembert catgut suture. Prompt recovery followed.

Some months previous to this, while pondering over the matter of how to reduce contact to a minimum when dealing with the stump of an infected appendix, I stumbled into a very simple method of secluding the stump of the appendix and that of the meso appendix by one ligature in one peritoneal pocket, and, in passing, I may add that my colleague (Dr. Febilly) and I have employed it in many cases and find it as useful as it is practicable.

1. The meso-appendix is ligated and the appendix isolated in the usual manner; the ends of the ligature are not cut away.
2. A curved intestinal needle is then attached to one end of this ligature and a three-insertion (two lateral and one anterior) purse-string suture is passed, at a distance of about one-third of an inch, around the base of the appendix; the anterior point of suture is purposely inserted beneath the anterior longitudinal band.
3. The needle is then removed and the ends as well as the loops of the purse-string suture are left loose and kept out of the way while the appendix is clamped at the level of the caecum, separately ligated, and cut away.
4. The ends of the "ligature suture" are then sought for, and as they are tied together (the assistant with a dissecting forceps pushing the appendical stump backwards) both stumps instantly and definitely disappear from view; only two things touch the raw surface of the stump of appendix—the knife and the dissecting forceps.

The above is the first instance in which I found the stump of the meso-appendix *in flagrante delicto*, but I have often suspected its complicity in pelvic adhesion jungles; however, knowing the tendency that peritoneum has to adhere to any raw surface, I think I may safely advocate burial of this stump, particularly as both it and its mate (of the appendix) can be readily interred together with the same bit of string.

Peritonization of Stump after Salpingo-oöphorectomy.

After periodic attempts at rotating the ovarian or salpingo-ovarian stump downwards and suturing it face backwards on the anterior shelf of its broad ligament I have definitely abandoned the procedure, as I found it almost impossible to avoid, even with blunt instruments, the occasional formation of a troublesome intraligamentous haematoma; and, moreover, the manipulation necessary for such adjustment endangered the security of the pedicle ligature. Instead, I have adopted a much more simple and more readily applicable method, which can be always resorted to without "asking for trouble": a web about one or two inches square is excised from the omentum and plastered over the surface of the stump, and a piece of fine silk (or the ends of the ligature) is made to secure it, in bonnet fashion, around the neck of the same. In infected cases I always employ catgut instead of silk for ligation of the pedicle and for fixation of this omental "patch."

I beg leave to make a digression in stating that, irrespective of the result of any previous examination, and regardless of the "authority" who made it, whenever the abdomen of a female is opened for removal of the vermiform appendix, the opportunity should never be lost of making an internal digital examination of her uterus and ovaries, and I guarantee anyone who follows this advice that he will be astonished at the frequency with which he will strike a coincidental lesion in these organs. For this reason it is imperative to adopt a right vertical incision when performing appendicectomy in womankind.

In conclusion, I must crave indulgence for occupying so much space with practical details, yet, acting on "the faith that is in me," it is the close study of minutiae and their application in workmanlike order which makes for operative efficiency.[5]

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[1] Operating to the Clock, BRITISH MEDICAL JOURNAL, January 31st, 1914. [2] Appendicitis, *Lancet*, February 3rd, 1900. [3] Immediate Operation in Appendicitis, *Lancet*, September 5th, 1914. [4] Gastro-enterostomy, *Lancet*, October 26th, 1912. [5] Operating to the Clock, BRITISH MEDICAL JOURNAL, December 21st, 1918.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

CHOLECYSTOGASTROSTOMY.

ON July 4th, 1922, I was asked by Dr. Dykes to see a lady, aged 60, who was suffering from deep jaundice and severe abdominal pain. In December, 1921, I had removed ninety-five stones from her gall bladder. She remained well until a month ago.

On opening her abdomen I found that her symptoms were due to stricture of the common bile duct; no stones were found. It has been my practice in these cases to make an anastomosis between the gall bladder and the duodenum, or, if more convenient, between the gall bladder and the transverse colon. In the present case there were so many adhesions that neither of these situations was favourable. Bearing in mind the recommendation brought forward by Mr. C. A. Moore in the BRITISH MEDICAL JOURNAL of November 19th, 1921 (p. 826), I made an anastomosis between the gall bladder and the stomach on its anterior wall about an inch inside the pylorus. The result has been entirely satisfactory. The jaundice has disappeared and the pain has not recurred.

I feel it is right to add my testimony to the value of this operation because there must be many cases which would be benefited by it.

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HYDROA AESTIVALE IN IDENTICAL TWINS.

IF we required to prove to demonstration that a rather rare affection of the skin—known to be excited by the sun's rays—was nevertheless mainly due to congenital vulnerability of the skin, we could not wish for surer proof than to meet with the affection in identical twins, living under identical conditions, displaying identical lesions (symmetrically distributed) at the same time of year.

I have recently met with such a remarkable coincidence, and as I am not aware of any such occurrence having been published I wish to record the chief facts. The patients were twin girls, aged 11, remarkably alike in every way. They have had two outbreaks this year, each outbreak of hydroa occurring, of course, with the change of weather from dull and cool to bright and hot. They each had simultaneous and similar outbreaks last year and the year before.

Their faces are deeply freckled. There are a few vesicles on their faces and on the backs of their hands. Scars of former lesions can be found on their faces, but are more numerous and conspicuous on the backs of the hands. The lesions heal up and do not tend to recur as the girls become accustomed to summer heat and sunshine. The other children of the family do not suffer in this way, and there is no family history of the complaint. The freckles on the faces are so numerous and some of them so large and so black as to amount to serious disfigurement. At first glance the freckles reminded me of xeroderma pigmentosum, but a further inspection easily excluded such a serious diagnosis. Unna described the affection as "hydroa puerorum," doubtless because it occurred chiefly in boys in Germany. Girls now, in England at least, live more outdoor lives, and in my experience are quite as liable as boys.

As to prognosis and treatment: I could promise the cessation of outbreaks in three or four years' time and great improvement at once by treatment. Gloves were to be worn and wide-brimmed hats, and the seaside holidays taken where the aspect was east or north instead of south, as was their habit. With a southern aspect a double dose of sunlight is experienced—direct sun rays and those reflected from the sea surface.

As in the case of all bullous and vesicular eruptions care should be taken that antiseptics are applied sufficiently often to prevent infection and its resulting (preventable) scarring. At night the skin can be gently mopped with solution of carbolic acid, say 1 in 60. Then a cold cream containing boric acid for the night only. During the day a calamine lotion can be painted on. It incidentally excludes some amount of light, hides freckles, and is not itself unsightly.

London. ALFRED EDDOWES, M.D., M.R.C.P.

THE FOETAL HEART.

IT has been stated that crepitation of the foetal head bones constitutes practically the only positive diagnostic sign hitherto reported of intrauterine death. The hearing of the foetal heart, on the other hand, is a very reliable sign of life, but one about which apparently even the wisest may be misled. Some years ago, on this evidence of life, two able gynaecologists roused in a hitherto childless and fibroid patient indescribable feelings of joy. I was present at the Caesarean hysterectomy next day, and shall never forget the chagrin of the surgeon as he removed a long dead and macerated foetus.

With the above as my apology, I beg to mention an expedient which has seldom if ever failed me. The chestpiece of an ordinary binaural stethoscope, as it hangs from the ears, is allowed to rest on the desired portions of the abdomen untouched by the fingers, any tendency of the chestpiece to slip being corrected by the position of the patient, complete contact being of course necessary. In this way, the otherwise unavoidable and misleading vibrations set up by the muscular tension of the hand being absent, one can say with certainty whether one hears the foetal heart or not. Doubtless to many this method is no novelty, but as a student I was left to find it out.

Reading. DONALD E. MORLEY.

SURGEON LIEUT.-COLONEL DONALD ELCUM, I.M.S. (ret.), who died on August 8th, left £17,580 net personalty. Subject to certain legacies he leaves the residue of his estate in trust for his brother and sister, and on the death of the survivor of them to Guy's Hospital for beds to be called the Charles Frederick Elcum Beds, in memory of his father, formerly a student there.

Reviews.

CARDIOLOGY.

THIS monograph by Dr. LOUIS GROSS, entitled *The Blood Supply to the Heart*,[1] is a valuable contribution to the literature of the subject. It contains a full and detailed description of the arterial and venous blood supply to the normal heart, with special reference to the common variations; and an account of the blood supply to the two nodes (S.A. and A.V.) and to the bundle and its branches. The author is of opinion that a distinct and specific blood supply exists for both sino-auricular and auriculo-ventricular nodes, the main bundle, the first portion of the left limb, and a large part of the right limb of the neuro-muscular system. This opinion is based on a study of one hundred hearts. A valuable chapter deals with the blood supply to the valves of the heart in its relation to the incidence of inflammation of the valves, and a most interesting description of the changes in the coronary arteries accompanying the advance of years. As the heart grows older the coronaries become more tortuous, and there is an ever-increasing left-sided vascular preponderance. Coincidently there is an increase in the number of the rami telae adiposae. Dr. Gross looks on this as a most important functional and compensating unit. Relative poverty in the blood supply to the right heart is characteristic of senility and one of the dangers of advancing years. In fact, as Dr. Gross says, "a man is as old as his right coronary artery." The method used for making the anatomical investigations is described in the first chapter. Dr. Gross employed an injection of barium sulphate suspended in gelatin; from the hearts thus injected roentgenograms were obtained; they were then dehydrated in alcohol, cleared in oil of wintergreen, and finally dissected and sectioned. Coloured gelatins were also used for injection, so that the ramifications of one coronary artery could be distinguished from those of the other. A full and detailed description of the processes is given. The illustrations are exceptionally good, but their value would have been increased had some method been employed by which the various subdivisions of the coronaries and other points of interest could have been indicated. The whole subject is presented in clear and readable style, and the book is probably the best of its kind yet published.

THE heart exists for the purpose of maintaining an efficient circulation. It is essentially an apparatus designed to circulate its contents, and Dr. Sainsbury in his book, *The Heart as a Power Chamber*,[2] views the phenomena of the circulation from the essential dynamic standpoint and advances certain views for which he asks the consideration of his readers. He describes the aorta as a transformer interposed between the heart and the capillaries, and he discusses the mode of functioning of the aortic valve, maintaining that the structure is such as to bring about and maintain a central flow during systole, the valve never being fully opened. He claims that this is of material importance in preserving the integrity of the aorta. His detailed and reasoned criticism of the interpretations of records from the jugular vein is vitiated by the fact that he does not recognize that these tracings are records not of *pressure* but of *volume*. On page 202 the author describes an extension of fibrillation below the auriculo-ventricular sulcus into the substance of the ventricle, and regards this change as "a much more serious condition" It is evident, however, that he does not appreciate the lethal nature of fibrillation when it involves the ventricle. After carefully reading this book the question presents itself: What is the aim of the author? His answer, found on page 239, will perhaps help in appraising the work. Dr. Sainsbury says that his real objective will have been attained if "the anatomist and pathologist may be led, in the presence of the statics of death, to endeavour to reconstruct the dynamics of life; and the physician be led in like manner, in the presence of the disturbed dynamics of disease, to recall the teachings of physics and chemistry and physiology, and to endeavour to enlist them on behalf of the healing art." To quote again from the same chapter in which reference has

[1] *The Blood Supply to the Heart in its Anatomical and Clinical Aspects.* By Louis Gross, M.D., C.M. New York: Paul B. Hoeber. (Sup. roy. 8vo, pp. xvi+171; 34 figures. 5 dollars net.)

[2] *The Heart as a Power Chamber: A Contribution to Cardio-dynamics.* By H. Sainsbury, M.D., F.R.C.P. Oxford Medical Publications. London: H. Frowde, and Hodder and Stoughton. (Demy 8vo, pp. xii + 248; 23 figures. 12s. 6d. net.)

been made to "the therapeutic appeal," the following occurs: "What then are the means at our disposal to answer the appeal? They belong to the order of the medicamenta which in their wide range constitute the materia medica as embodied in the pharmacopoeias of the world." These quotations will give an idea of the author's style, which while having a charm of its own is rather too florid and ornate for dealing with a subject requiring lucid and clear presentation.

MORBID ANATOMY.

CONTRIBUTIONS to morbid anatomy are not nowadays so common as to be passed by without a few words of special comment. And in his new book Professor OBERNDORFER[3] has achieved something out of the ordinary. He has published a series of photographs, reproduced very well by a copper process, representing the gross *post-mortem* appearances of various abdominal conditions. The plates are a selection from his large collection, and embrace carcinomatous and tuberculous peritonitis, intestinal obstruction, duodenal ileus, hour-glass stomach, gastroptosis, caecum mobile, megacolon and coloptosis, mesenteric infarct, and pregnancy. Several specimens of the above and of other conditions are exceedingly good, and have been used, with the aid of a projection apparatus, by the author for his lectures. Teachers in this country would find them admirably suited for this purpose.

Good though the pictures are the chief interest of the book lies in the author's comment on the anatomy of these conditions. He proves himself to be very well read in clinical medicine, and particularly so in clinical surgery. His remarks on the mobile caecum show him to be well abreast of the times. And in this connexion he makes a remark, not perhaps original, but which surgical anatomists will do well to take to heart. He points out that the position of the appendix varies greatly with variations in the mobility of the caecum. The usual textbook dissertations on the position and relationships of the appendix do not give this factor its due. Further, all who operate upon diseased appendices realize that the ease of removal of that organ greatly depends on the fixity of the caecum from which it springs. Professor Oberndorfer has found Holzknecht's steer-horn stomach to be rare (save in infants), thus endorsing the modern radiologists' views. He believes from his *post-mortem* observations that acute dilatation of the stomach is due to duodenal ileus—compression by the mesenteric vessels. He has found in cases of hernia that the mesentery of the piece of bowel involved is always lengthened and frequently scarred, the scars often running as fibrous bands some considerable distance, even to the root of the mesentery. These scars he puts down to slight tears in the serosa, and cicatrization of the consequent exudate. As for the local lengthening of the mesentery he states that in old-standing cases observation will always lead to the identification of the piece usually habitant in the sac.

Professor Oberndorfer's book will well repay study on the part of those who are interested in abnormal anatomy. The *post-mortem* room offers unrivalled opportunity for the investigation of such problems as have been touched on in this review, and it is interesting to see that somebody is taking advantage of them.

THE FOUNDATIONS OF PSYCHOLOGY.

DR. JARED SPARKS MOORE intends his volume on the *Foundations of Psychology*[4] to serve as a textbook in advanced courses in general psychology and for the general reader interested in the nature and methods of mental science. The work contains matter not found in the ordinary textbook or manual, and thus fills a gap in psychological literature. Psychology presents serious difficulties to the student at the present time because there is no general agreement as to its scope, aims, or subject-matter. Naturally the author is not able to harmonize the disagreements which exist or to devise a formula which would content the various antagonists. No one could do this, and the author has his own views to develop; but he does succeed in making clear the principles and assumptions which underlie the opposing schools of thought, and his volume will undoubtedly serve to remove some of the difficulties which confront the student, who will at least learn from it what the structuralist, functionalist, introspectionist, behaviourist, and the rest are endeavouring to accomplish in their respective spheres.

The volume is divided into three books or sections. The first is devoted to an exhaustive discussion of the definition of psychology. The view ultimately developed is that psychology should be defined as "the science of mind." By this definition the author designedly narrows the scope of psychology to the study of mental states, and gives a central and unique place to introspection as *the* psychological method. He gives full credit to behaviourism, and recognizes that it has a positive significance for psychology, but would prefer to include it in the biological sciences under the heading of "praxiology." It is improbable that the majority of psychologists would care to limit the scope of their investigations to the extent suggested, and in practice, in this country as well as elsewhere, psychology is assuming an increasingly behaviourist tendency, with emphasis on the "situation-response" relation, in which introspection plays a very small part. The middle position taken by McDougall is perhaps the most desirable in the present state of knowledge, though it is interesting to observe that the famous English psychologist has recently taken what appears to be a more conservative attitude (Prolegomena to Psychology, *Psychological Review*, January, 1922).

Book II is concerned with the "The field of psychology"; the subject is discussed under the following headings: psychology and metaphysics; the problem of science; the problem of metaphysics and its relation to science; psychology as science and as metaphysics; psychology and real life; psychology and the material sciences; the differentiation of mental from material facts; conditions of psychological description. Book III deals with the postulates of psychology, and the hypothesis of the subconscious, to which the author expresses adherence, is considered at length. Freud's hypothesis of the "unconscious" is only discussed from the theoretical point of view and the treatment of this subject is purely on academic lines.

GENERAL SURGERY.

DR. HAUBOLD, Clinical Professor of Surgery in New York University, has written a treatise entitled the *Principles and Practice of Surgery*[5]; it contains 2500 pages, and is issued in two volumes in a manner which on the whole does credit to the publishers, though the illustrations might be better. Those which have been reproduced from other publications are good, but the majority of the original illustrations are poor; many of the line drawings convey little information, and here and there the draughtsmanship is faulty.

Volume I is more especially concerned with the problems of general surgery, though it contains instruction for amputations and the ligation of blood vessels. The author is sometimes not altogether happy in his choice of words and terms. "Thyroidism" is quoted as an example of "the circulation of a faulty secretion"; "uraemia" is defined as "an accumulation of excretions"—these are surely inadequate descriptions of the conditions they purport to explain. Many pages, indeed, are marred by one or more unfortunate errors of expression. The actual surgical matter the book contains is also open to criticism. Many of the views the author puts forward are out of harmony with modern surgical teaching. The first chapter deals with wounds, and in it this remarkable passage appears:

> "The leukocytes (phagocytes) perform an important office, as they absorb the destroyed cells by the production of ferments which are capable of dissolving albumen, and also produce a protective substance chemically destructive to pathogenic bacteria, which, despite the most rigid precautions, prophylactic or antiseptic, are present in wounds."

The pathology of this statement is erroneous, the method of its expression is not good, and the sweeping generalization at the end is open to serious question. It is said that the constitutional symptoms of wounds are "shock and acute anaemia." The experienced clinician is well aware of what Professor Haubold has in his mind when he makes this statement, but to the student beginning the study of surgery the impression conveyed may well be erroneous. In discussing the treatment of wounds it is said that "the use of

[3] *Pathologisch-anatomische Situs-bilder der Bauchhöhle.* By Professor Siegfried Oberndorfer. Munich: J. F. Lehmann. (Med. 8vo, pp. 133; 92 plates, 92 figures. 20s.)

[4] *The Foundations of Psychology.* By Jared Sparks Moore, Ph.D., Associate Professor of Philosophy in Western Reserve University. Princeton: Princeton University Press; London: H. Milford, Oxford University Press. (Med. 8vo, pp. xvi + 239. 12s. 6d. net.)

[5] *Principles and Practice of Surgery.* By Herman A. Haubold, M.D. Two volumes. New York and London: D. Appleton and Company. (Roy. 8vo. Vol. I, pp. 1316, 631 figures; Vol. II, pp. 1170, 413 figures. £4 4s. the two volumes.)

chemical haemostatics such as alum, vinegar, cold water, zinc chloride, etc., increases the danger of infection, because they liberate infectious organisms from the contiguous tissues and spread them into the wound area." We are unaware of any proof of this statement; the stronger haemostatics may devitalize the wound tissues and so render them more liable to infection, but it is difficult to understand how a solution can liberate infectious organisms from contiguous tissues. In a chapter dealing with the technique of cleansing the surfaces of the body it is advised that, after scrubbing with soap and water, the hands and forearms should be coated with chloride of lime made into a paste with water; while the lime is still on the skin sodium carbonate is to be applied, thus liberating chlorin, an active bactericidal agent. The application, the author says, produces a sensation of warmth, and directs that when this has ceased the paste is to be washed off with a 1 per cent. solution of corrosive sublimate. Later on he says that complete removal of the mixture is accomplished by rinsing the hands and forearms in a solution of sodium carbonate 2 per cent. before the corrosive solution is applied; the hands and forearms are then immersed in alcohol, which is rinsed off with sterile water. One wonders whether the author puts this method into daily use; if so, he must be possessed of infinite patience.

Volume II also is open to serious criticism. The section dealing with deformities and orthopaedics is a fair presentation of the subject, but there is little original matter of interest, and there are some serious inaccuracies. The chapter on spondylitis is difficult to accept as a statement of the author's knowledge and experience. We disagree altogether with the account given of the pathology; some idea of the standard of the chapter can be gained from the advice that when an abscess forms it should be "drained with the view of obviating gravitation of the products of inflammation to a distant point and secondary invasion *en route*."

As we have indicated, the blemishes in these volumes are, in our opinion, too numerous to warrant its acceptance as an exposition of the present state of American surgery from which surgeons all over the world are learning so much.

MENTALLY DEFICIENT CHILDREN.

THE fifth edition of *Mentally Deficient Children*,[6] by Drs. G. E. SHUTTLEWORTH and W. A. POTTS, appears at an opportune time, since public interest is greatly directed to all things connected with mental deficiency and disorder. Since the issue of the last edition the provision for the care of the defective class has been considerably extended in England by the Act of 1913, and the activities of public authorities have been increased in the United States as well as in this country. All these developments receive attention in the new edition. The descriptions of mental tests have been brought up to date, and the many advances made during recent years in the procedure for dealing with juvenile criminality are explained.

Psychotherapeutic methods in the management of emotional cases, in psychic epilepsy, and in the development of cleanly habits among defectives, are discussed, though the authors, we gather, do not consider the results obtained very conclusive; yet some improvement has been noted in respect of the last-named matter.

Lists of institutions under the Mental Deficiency Act in this country, and of similar establishments in the Dominions and in the United States, are given. Some of the American institutions, in several instances, are large: one of them can receive as many as 2,200 inmates. There are appendices containing very complete bibliographical lists and other matters of interest. The work as a whole must be commended to all interested in these subjects for the general information and the trustworthy guidance in treatment it affords. The present edition merits all the praise that has been awarded to its predecessors.

THE SNAKES OF CEYLON.

COLONEL FRANK WALL'S elaborate description of the *Snakes of Ceylon*[7] is issued by the Colombo Museum, and copies may be obtained by application to Mr. Joseph Pearson, the director of that institution. The work is dedicated by Colonel Wall to his father, Mr. George Wall, who spent a laborious and useful life in the interests—social, industrial, scientific, municipal, administrative, and political—of the colony of Ceylon. The book is prefaced by a portrait and memoir of that very distinguished man, and may be accepted as a memorial to his father by a devoted and dutiful son. The work is an exhaustive record of all that is known regarding the serpents of Ceylon down to the present time, and indications are given of the need and direction of further research.

The author, who had previously written a treatise on the poisonous terrestrial snakes of our British Indian dominion (including Ceylon), has, in addition to his own observations in India and Ceylon, made use of all the information previous writers (Fayrer, Richards, A. J. Wall, Drummond Hay, and others) have contributed to this subject. The book contains full details regarding sixty-three species of terrestrial snakes found in Ceylon, and of twenty-two pelagic snakes frequenting its coasts. Each species is described systematically and exhaustively under the headings of the native name (when known), history, general characters, coloration, identification, habits and haunts, foes, parasites, food, breeding and growth, scales and teeth (illustrated), and distribution. While the information given under these categories is strictly scientific, entertaining matter of more general interest is supplied regarding the common and important serpents—for example, the python, cobra, krait, and Russell's viper (daboia).

Of more purely medical interest is the information presented at length regarding the venom of the Thanatophidia—its source, its nature, physical and chemical; its poisonous effects, local and general, and the measures necessary for dealing with them. The volume is well printed and indexed, and constitutes a valuable summary of all the knowledge which has been amassed in India and Ceylon respecting a most interesting department of natural history.

PHOTOGRAPHY IN COLOURS.

THE fourth edition of LINDSAY JOHNSON'S book on *Photography in Colours*[8] has been brought thoroughly up to date and is most comprehensive. In its general construction it is well thought out. After an opening chapter on the nature of light and colour there are chapters upon the evolution of colour photography, the sensation of colour, and so on; following this the different methods are explained—the single-plate colour processes and the three-plate and two-plate methods; colour printing is thoroughly explained, and there is a chapter on kinematography and another on colour photomicrography. An appendix, which shows evidence of careful compilation, gives many useful details about development, the after-treatment of the plates, and other photographic details; it includes also tables of exposures for various subjects.

In the author's hands, and judging from his lucid descriptions, colour photography either by the single or the three plate colour process appears to be quite simple, and the various photographic processes no more difficult to the ordinary amateur than those followed in the successful manipulation of the ordinary dry plate in ordinary photography. A very interesting chapter is that in which a comparison is made between the eye and a camera, and the retina and a colour plate. The author has written this in such simple language, and his descriptive material is so graphic, that he has made a somewhat difficult subject easy to be understood. The old saying that there is nothing new under the sun is illustrated by a note in the preface in which it is suggested that the Lumière autochrome process was in fact no new discovery, inasmuch as there is a remarkable similarity between the coloured globules in the retina of the tortoise and common fowl and the coloured starch grain of the autochrome plate. Therefore man has merely made a rediscovery of what the tortoise knew more than one million years ago. There are many useful illustrations, which are chosen chiefly from the point of view of value in making the written matter more easy to follow and understand. As a textbook upon a fascinating photographic process it achieves complete success. Nothing seems to have been omitted which is of any essential importance, and any amateur who desires information and help either as a beginner or as an advanced worker will find everything he requires.

[6] *Mentally Deficient Children, their Treatment and Training.* By G. E. Shuttleworth, B.A., M.D., and W. A. Potts, M.A., M.D. Fifth edition, considerably enlarged. London: H. K. Lewis and Co., Ltd.; Philadelphia: P. Blakiston's Son and Co. (Cr. 8vo, pp. xviii + 320; 8 figures, 21 plates. 12s. 6d. net.)

[7] *Ophidia Taprobanica, or the Snakes of Ceylon.* By F. Wall, C.M.G., I.M.S. Colombo: H. R. Cottle, Government Printer, Ceylon; or the Director, Colombo Museum. (Demy 8vo, pp. xxii + 581; 1 map, 98 figures.)

[8] *Photography in Colours.* By George Lindsay Johnson, M.A., M.D., F.R.C.S. London: George Routledge and Sons, Ltd. (Cr. 8vo, pp. xiv + 318; 14 plates, 31 figures. 7s. 6d. net.)

NOTES ON BOOKS.

THE fifth volume of the *Reports of the Episcopal Hospital*,[9] Philadelphia, is the first published since 1916. It is edited by Dr. ASTLEY PASTON COOPER ASHHURST, that versatile surgeon who makes the chief contributions to the volume. In the main the papers will be found to be reprinted from the *Annals of Surgery*, in which they first appeared either as independent articles or as contributions read before the Philadelphia Academy of Surgery. The volume contains a very varied assortment of papers on a variety of subjects, mostly surgical, but also medical, obstetrical, and dental. Amongst the contents are two long and instructive papers by Ashhurst—one on empyema, commenting on the frequency of interlobar empyema and urging the need for exploratory thoracotomy in doubtful cases, the other on birth injuries of the shoulder. All in all the *Reports* are a testimony to the very lively activity of the staff of a hospital of 500 beds, representing a praiseworthy amount of creative work.

The Homeland Association, which exists for the encouragement of touring in Great Britain, has issued a series of pocket books, including a guide to the Pilgrims' Way from Winchester to Canterbury, and three volumes of footpath rambles within easy reach of London. It has now added to its list a handbook on *Homeland Prehistoric Antiquities*,[10] written by Mr. W. G. CLARKE, formerly honorary secretary of the Prehistoric Society of East Anglia. It is well arranged, simply expressed, and contains numerous helpful illustrations; altogether it is excellently adapted to serve as an introduction to the study of a very fascinating subject for which this country, if we may accept the conclusions of the school to which the author belongs, affords almost inexhaustible opportunities. Flint implements and the way they were made are well described, the changes slowly produced in flints by weathering are explained, and the signs by which those worked by man can be recognized are detailed. There are chapters on dwellings, burial places and forts, on pottery, on bronze and early iron implements, and on the tracing of prehistoric trackways, the last a fascinating recreation to which Dr. Hubbard and his brother gave a great impetus in their book on dew ponds. Though Mr. Clarke writes simply and briefly he is not superficial; he provides a glossary, a list of type stations, a bibliography, and an index; the only fault we have to find with him is that he does not always give sufficient particulars of where the places he mentions are and how they may be reached.

A SPECIAL number has been issued (August, 1922) of the monthly journal, *Archives Médicales Belges*, published in Brussels, to celebrate the seventy-fifth anniversary of its foundation. The *Archives* was founded in 1847 by Dr. J. F. Vleminckx, who was the organizer of the medical service in the Belgian army of the revolution in 1830, and was the founder and first president of the Belgian Academy of Medicine. The special number contains an illustrated article on Vleminckx by Professor F. De Block, and articles on the technique of the operation for fracture of the patella by Professor Willems and on the standardization of the methods of analysing drinking water in the Belgian army by Captain Sillevaerts. The remaining contents of the journal include international news from the United States, Switzerland, and France, abstracts from Belgian and foreign medical journals, and medical news.

[9] *Medical and Surgical Reports of the Episcopal Hospital.* Vol. v. Philadelphia: Wm. J. Dornan. 1920. (Med. 8vo, pp. 505; 162 figures, 3 plates.)

[10] *Our Homeland Prehistoric Antiquities and How to Study Them.* By W. G. Clarke, F.G.S. (Homeland Pocket Books, No. 13.) London: Homeland Association, Ltd. (Pp. 140. 4s. 6d. net.)

MEDICAL AND SURGICAL APPLIANCES.

Hooked Anaesthetic Drop-bottle Collar.

DR. F. J. STRACHAN (Troon) writes: I have been using for the past two years a simple steel collar bearing two hooks to clip on to the neck of any anaesthetic drop-bottle. I have found it particularly useful when working single-handed in midwifery practice—when once about 50 per cent. of the chloroform was spilled on the bed. Now with this simple attachment the wastage is *nil*, as the upright position of bottle is always assured by the catches taking a slender yet sure purchase on a pillow, the bedclothes, bed hangings, etc., or on the patient's or one's own clothing. Even surrounded with the anaesthetist's armamentarium of the operating theatre the hooked clip is always very useful. Should the clip be too large for a narrow-necked dropper a few turns of adhesive plaster round neck will ensure a rigid fit. The drawing shows the idea *in situ*. These clips have been made for me by Messrs. Baird Brothers, 97, Bath Street, Glasgow.

BOTULINUS ANTITOXIN.

IN connexion with the recent cases of botulism at Loch Maree a leaflet (Circular 342) has been issued by the Ministry of Health to sanitary authorities in England and Wales stating that the Minister considers it advisable that a supply of botulinus antitoxin should be made available for medical officers of health and medical men in case of need at several centres, in order that it may be available for immediate use in the contingency of further outbreaks of this disease occurring.

"The Minister has no reason to anticipate further outbreaks, but the gravity and mortality of the disease may, on occasion, be such that he considers that all possible arrangements should be made to provide expeditiously a supply of antitoxin if and when demanded, which could be obtained more promptly than would be the case if the only available supply were obtainable from London. He is advised that immediate use of this antitoxin is of paramount importance and the lapse of a few hours between the appearance of symptoms and the use of the antitoxin may make all the difference between its successful or unsuccessful application. Further, on the occurrence of an outbreak of botulism all persons who have consumed the suspected food should be offered a protective dose of the antitoxin (10 c.cm. intramuscularly), even though they may not present symptoms of the disease."

Arrangements have accordingly been made for a suitable supply of antitoxin to be kept by medical officers of health at Portsmouth, Plymouth, Bristol, Cardiff, Aberystwyth, Birmingham, Oxford, Manchester, Liverpool, Carlisle, Newcastle-on-Tyne, Hull, Leeds, Nottingham, Cambridge, and Norwich, as well as at the Ministry of Health, Whitehall, London, S.W.1.

"In the event, therefore, of any outbreak of botulism [the Circular proceeds] the medical practitioner will be in a position to obtain with the least possible delay such antitoxin as he desires. This antitoxin has been prepared with great care, but there has not yet been any extended opportunity in England for its use, and therefore there has been but little experience of its therapeutic value. There appear to be good grounds, however, for hoping that it may prove beneficial in sudden cases of poisoning by *Bacillus botulinus*, the organism recently isolated in connexion with the outbreak of disease at Loch Maree in Ross-shire. It will be understood that, whilst the Ministry of Health are thus endeavouring to make this antitoxin more readily available, the responsibility for its actual use must rest solely with the medical advisers of the patient, in any and every particular instance, and the authority will no doubt consider it desirable to inform all medical practitioners in their area of these arrangements."

Enclosed with the Circular is a copy of the instructions for employing the botulinus antitoxic serum prepared by the Wellcome Physiological Laboratories at Beckenham. These are as follows:

BOTULINUS ANTITOXIC SERUM.

Instructions for Use.

Immediate Administration.—The only remedy at present known for botulism is botulinus antitoxin given by injection, and even this is unlikely to save life if the disease has progressed to a late stage. It is therefore of the greatest importance *to give the antitoxin at the earliest possible moment*—that is, as soon as the earliest symptoms of blurred or double vision, giddiness, ptosis, difficulty in speech or swallowing, etc., suggest the diagnosis of botulism.

Method.—The effectiveness of treatment by antitoxin for botulism is so greatly increased by intravenous injection that this method of administration should always be employed if possible (otherwise the intramuscular method should be used). The risk of serious symptoms arising in persons highly sensitive to horse serum must be recognized, and when, in the judgement of the medical practitioner, such risk is likely to be great, he should administer a preliminary injection of a small quantity of the antitoxin (0.5 c.cm. = 8 minims) *subcutaneously*. If this produces clear evidence that the patient is sensitive (that is, if a reaction appears in half an hour), then the antitoxin must be given with particular caution, the first intravenous injection, consisting of 0.5 c.cm. of antitoxin, being diluted with 50 c.cm. of saline, and subsequent injections being diluted less and less till the full dose has been administered.

Dose.—Only large doses will save acute cases. The intravenous dose should be from 20 to 50 c.cm. of the antitoxin, previously warmed to body temperature, and injected very slowly. This amount may be repeated daily if necessary.

Note.—All other persons who have consumed the suspected food, but have not yet presented symptoms, should be given a prophylactic dose of antitoxin (that is, 10 c.cm.) intramuscularly, to be followed by larger doses intravenously should symptoms appear.

MESSRS. J. AND A. CHURCHILL announce for early publication a *Synopsis of Surgical Diagnosis*, by Mr. W. H. C. Romanis, F.R.C.S.; the fifth edition, with 48 plates, of *Pathology, General and Special*, by Professor R. Tanner Hewlett, M.D.; and the third edition of Professor Greenish's *Microscopical Examination of Foods and Drugs*.

British Medical Journal.

SATURDAY, SEPTEMBER 30TH, 1922.

THE PREVENTION OF STILLBIRTHS AND NEO-NATAL DEATHS.

THE discussion at the Glasgow meeting of the British Medical Association on stillbirths and neo-natal deaths (reported in full this week) followed closely along the lines which had been sketched in the JOURNAL,[1] and it reached the importance which had been anticipated there. Although causation and pathology were constantly in evidence during the proceedings, it is no exaggeration to say that the most impressive note was struck in connexion with prevention. Over and over again the large gathering which had come together in the Section of Obstetrics and Gynaecology responded to the suggestion of life-saving on an extensive scale which was more than hinted at by the various speakers. So far as the trend of the discussion was concerned, an equally appropriate title for it would have been "Foetal Life Preservation," and in the end these words or something equivalent found their way into the resolution which was adopted by the Section and sent on to the Council of the Association.

The introductory remarks by the President (Professor Ewen J. Maclean of Cardiff) emphasized the national importance of fertility and the saving of young lives. Dr. J. W. Ballantyne of Edinburgh opened the debate with a communication in which he sketched (but necessarily in brief) the present position of knowledge in respect of the causes, pathology, and prevention of ante-natal, intra-natal, and neo-natal death. It was a coincidence that when the British Medical Association last met in Glasgow, thirty-four years ago, the Obstetric Section had dealt with intrauterine death; the subject was introduced then by the late Sir Alexander Simpson, and leading British and American obstetricians joined in the discussion. The contrast between then and now was striking, especially in the absence (in 1888) of the idea of supervising all pregnant women in the interest of the few who were in danger of having stillbirths; preventive medicine has made great advances since then.

In his survey of the whole subject Dr. Ballantyne touched upon many matters of interest and upon some of controversy. He put in a cogent plea for the adoption of the word "transanimation" for the passage of foetal into post-natal life; his argument for abandonment of the present-day significance of stillbirth (as equivalent to dead-birth), although well founded, is not so likely to be acted upon in view of the stereotyping of the new usage by the Central Midwives Boards of England and Scotland. When he came to speak of the causation and pathology of stillbirth he was able to point cheerfully and with high appreciation to the results of the co-ordinated research work recently carried out under the Medical Research Council in various centres in Great Britain; and several of the research pathologists who followed him in the discussion showed how good and productive that work had been. He placed before the Section a few of the many remaining problems in ante-natal pathology when he asked: What was the mechanism of ante-natal as compared with post-natal death (for example, in asphyxia)? How were the changes associated with *post-mortem* maceration to be distinguished from those due to the causes of the death and subsequent maceration? What was the rôle of the placenta? and How were all the phenomena affected by the fact that the uterine interior was normally a germ-free cavity? There was much work for the research pathologist waiting to be done, and only a few tasks had been referred to. Dr. Ballantyne said that he was not offering an ordnance survey map on a generous scale of the territory of ante-natal disease and death—he was merely blazing a trail through a part of the country. It was when he came to speak of the results of ante-natal clinical supervision and treatment in the prevention of ante-natal, intra-natal, and neo-natal death that a note almost of triumph began to be heard in the address; and there was more than a touch of the dramatic when he stated that expectant mothers in Edinburgh who were free of the venereal diseases and had been adequately supervised in their pregnancy had a stillbirth rate of 6 per 1,000, whilst those who suffered from the venereal diseases and who had received no ante-natal supervision or treatment had one of 606 per 1,000. In a remark "aside" he noted the coincidence that the worst rate (606) should suggest the means (salvarsan) for its own reduction.

Dr. Eardley Holland dealt with the subject of intra-natal death, a matter for which his recent valuable work (mentioned not long ago in this JOURNAL[2]) specially fitted him. It was a pity that the impish behaviour of the lantern took away some of the effectiveness of the demonstration which he gave of the results of head pressure in the production of tears of the tentorium cerebelli and cerebral haemorrhage during the act of birth; but Dr. Holland established clearly the frequency of this cause of intra-natal death in the specimens which he had examined. There was the note of hope in his communication also, for head pressure can be prevented, and in what he called the "tactics" of stillbirths prevention—namely, the thoughtful management of each labour, with the interests of both child and mother in view—there is the opportunity of much foetal life-saving. Professor Louise McIlroy treated very ably the subject of "Foetal death due to toxaemia," and she also made a strong appeal for the wide adoption of ante-natal care as a means of lessening the frequency of stillbirths. Her part in this year's discussion pointed another contrast with the debate on intrauterine death in 1888; on that occasion no medical woman spoke.

Dr. F. J. Browne spoke with authority upon a subject which he had made specially his own—"Neo-natal death." The meeting was quick to recognize that behind the lantern demonstration which he gave lay a vast amount of research work; and the publication of his contribution in full in our present issue will be welcomed by many. He laid special stress upon the fact which he had discovered, that the absence of naked-eye changes alone was quite insufficient to exclude neo-natal syphilis; recourse must always be had to microscopical examination. What he had to say about the intra-natal development of pneumonia neonatorum[3] in labours in which early rupture of the membranes had occurred was arresting, and suggested the possibility of yet other microbic infections arising during the course of delivery. Still more startling was the statement that a pneumonia thus acquired might prove fatal to the infant before its transit through the birth canals was completed and so be a cause of stillbirth as well as of neo-natal death. Dr. J. N. Cruickshank also compressed a great deal of research into his paper on "Syphilis as a cause of ante-natal death"; he was dealing with a vast quantity of material, both clinical and pathological, made available in connexion with the work of the magnificent Royal Glasgow Maternity Hospital. Dr. Gilbert I. Strachan of Cardiff was dealing with a peculiarly difficult subject

[1] BRITISH MEDICAL JOURNAL, July 1st, 1922. p. 19.

[2] BRITISH MEDICAL JOURNAL, July 1st, 1922, p. 15.

[3] Ibid., March 25th, 1922, p. 469.

—placental changes in relation to foetal death—but his contribution, like the others, excited and thoroughly deserved lively interest.

Many noteworthy remarks were made by the speakers (eight in number) who took part in the discussion which followed the reading of these papers, although there was perhaps a tendency to branch off upon the fate of the "aftercoming head" and leave out other important questions. There could, however, be no division of opinion as to the practical value of the morning's discussion. The dominant note, sounded again and again by various speakers, was this: stillbirths are largely preventable, and the chief method of their prevention is ante-natal supervision and care. The note of prevention was still sounding on the following day, when eclampsia engaged the Section's attention.

ARTIFICIAL PNEUMOTHORAX.

THE Tuberculosis Committee of the Medical Research Council has issued a Report[1] by Dr. L. S. T. Burrell and Dr. A. Salusbury MacNalty on the treatment of pulmonary disease by inducing a pneumothorax. The authors have brought together the chief scientific and practical considerations that are now available in profusion for "making judgement of the remedial value of 'artificial pneumothorax'—that method of treating disease of a lung by giving it controllable periods of rest from respiratory movement."[2] Radical though this treatment is, it is not new. Dr. Allen K. Krause has recently pointed out that it is more than 2,000 years old, and in Section 59 of the second book *On Affections*, reproduced in Littré's bilingual text of Hippocrates, the following passage occurs: "If this affection results from a wound, or, as sometimes happens, from an incision for empyema, one should attach a pipe to a bladder, fill the bladder with air, and send the air into the interior of the chest." Dr. Krause concludes that this therapeutic method was actively practised by the Hippocratic school, and it is not likely that the passage just quoted could have been the reflection of speculative considerations only.

The treatment was revived in 1821 by Dr. James Carson of Liverpool. Some sixty years later Professor Forlanini of Pavia laid the modern foundations of this treatment, which has since steadily gained ground and is now counted among the greatest advances made in the treatment of severe pulmonary disease. The amount of work in this field during the past twenty years is prodigious, and the publications concerned therewith have become so numerous that the Medical Research Council has done well to issue at the present time a survey, both comprehensive and critical. As pointed out in the introduction to the Report, "it is of the first importance that results of physiological experiment and of professional experience should be gathered as fully as possible, not only with a view to giving a proper basis of support for this operative procedure, but no less with a view to aiding the accuracy by which the most suitable cases for the treatment can be recognized and selected."

The Report consists of two parts. In the first, Dr. Burrell discusses practically every aspect of the subject, from its history to the after-effects of treatment, and gives a summary of his first 150 cases. Patients with rapidly progressive disease and with a low power of resistance benefit little; on the other hand, for patients whose power of resistance is high, sanatorium or other medical treatment is alone sufficient to arrest the disease. It is in the intermediate class, presenting the disease in a subacute form, that treatment by the production of artificial pneumothorax may do good, provided the healthier lung is not too extensively involved. The risks of artificial pneumothorax are so small, and the chances of the disease spreading are so great, that in Dr. Burrell's opinion all patients in this stage of the disease should at least be given the opportunity of pneumothorax treatment. In his opinion it is, indeed, the only method of treatment which gives any real chance of permanent benefit. Puncture is preferred to the open method advocated some years ago by Brauer. The various steps of the operation are described in detail; such complications as pleural effusion, air embolism, and pleural reflex are discussed, and the best methods of avoiding them pointed out. The comparative importance of air embolism and pleural reflex is not yet clearly defined, though, thanks to Brauer and his assistant Wever, the mechanism of gas embolism is now better understood. They have shown that it is not necessary to introduce air from without and through a hollow needle to cause air embolism; it may follow the wounding of a blood vessel, air from the lungs being sucked in through the opening. The belief that pleural reflex may be the cause of death following puncture of the chest has been disputed, but Dr. Burrell refers to two cases of his own in which the fatal issue may have been due to this cause; in one death was immediate. He classifies his first 150 cases into three groups. In the first an efficient pneumothorax was produced; in the second only a partial pneumothorax was obtained, treatment being continued for less than two months; and in the third pneumothorax was impossible owing to adhesion of the pleural surfaces. Among the 107 cases in the first group there were as many as 40 in which the disease was arrested and 22 in which improvement was effected. The results in the other two groups were not so good, and the difference in the results obtained in the first and third groups may be taken as the measure of the value of the treatment.

The second part of the Report consists of answers by sixteen British physicians to a set of questions addressed to them. These answers are published in full and are then analysed by the authors. It appears that since 1910 these sixteen physicians have dealt with between 14,000 and 15,000 cases treated by the production of artificial pneumothorax. The first and most striking fact is the unanimity of the replies—". . . a favourable answer is returned by all with no uncertain voice." But some difference of opinion prevails as to the class of case most suitable for this treatment. On the one hand, Mr. H. Morriston Davies considers that no case is too early, and that an early case does not necessarily mean that the patient has a good resistance and will, therefore, respond satisfactorily to ordinary hygienic methods. Dr. Esther Carling, Dr. Lillingston, and others, on the other hand, would reserve this treatment for more advanced cases, and the general consensus of opinion seems to be that institutional treatment should, as a rule, be given a fair trial before collapse treatment is adopted. As the authors say, "however doubtful the operator feels of employing the method for an early case of tuberculosis, as soon as he perceives the disease is not yielding to ordinary methods of treatment an artificial pneumothorax should be induced as soon as possible."

The success of treatment by artificial pneumothorax has had remote as well as immediate effects. In addition to restoring many patients to comparative health, it has paved the way for other measures, such as thoracoplasty, which, without the lead given by pneumothorax treatment, would not have been so widely used. At the

[1] Report on Artificial Pneumothorax. By L. S. T. Burrell, M.A., M.D., M.R.C.P., and A. Salusbury MacNalty, M.A., M.D. Medical Research Council. Special Report Series No. 67. H.M. Stationery Office. 1922. (Pp. 104. 2s. 6d.)

[2] Acknowledgement is made of the assistance given by Dr. Clive Riviere, Mr. H. Morriston Davies, Dr. S. Vere Pearson, Dr. de Carle Woodcock, Dr. Lillingston, Dr. Parry Morgan, the late Dr. H. G. Felkin, Dr. R. C. Wingfield, Dr. Murray Garden, Dr. A. C. Inman, Dr. Stanley Melville, and Mr. Cheese.

meeting in April, 1922, of the Deutsche Gesellschaft für Chirurgie[3] Brunner of Munich stated that Professor Sauerbruch had performed 500 thoracoplastic operations for pulmonary disease. His results and those of Professor Bull in Norway and Professor Saugman in Denmark are remarkably similar, and show that in about 30 to 40 per cent. of otherwise hopeless cases in the third stage of the disease the patient ceases to have sputum and becomes fit for work. In another respect treatment by the production of pneumothorax has influenced our conceptions of pulmonary tuberculosis. It has shown that the first essential to the arrest of active tuberculous disease in the lungs is immobilization, and that the more complete the rest given to a tuberculous lung the more rapid is the healing process. This principle is as old as it is sound, but a few years ago it was being challenged by the doctrine of auto-inoculation and of the focal reaction, which was a reversal of the adage, "Let sleeping dogs lie." Pneumothorax treatment has shown that immobilization, so successfully practised in surgical tuberculosis for many decades, is applicable also to pulmonary tuberculosis.

THE TREATMENT OF LEPROSY.

THE increasing use of the improved method of treating leprosy by intravenous and intramuscular injections of soluble products of chaulmoogra and other oils is already producing results undreamt of only a few years ago, as testified to by reports now arriving from affected countries in various parts of the world. Thus in India the treatment was commenced in the largest leper asylum in that country at Purulia early in 1921, under Dr. Muir's direction, and he has recently sent home the figures of the mortality among the 700 lepers there. These show a reduction of the death rate in the first six months to 66 per cent., in the second six months to 29.6 per cent., and the first six months of this year to only 21 per cent. of the average rates for the three years before the treatment was begun in the same months of the year—a remarkable result in a chronic disease in such a short time as eighteen months, even after allowing for some improvement in health due to simultaneous treatment for hookworms. Nor is this an isolated result, for recent reports received by the Mission to Lepers show a similar reduction of the annual death rate in the Fusan leper asylum from 25 per cent. to 5 per cent., the mortality in both this and the Purulia asylum having thus fallen to one-fifth of the former rate, while these and other similar institutions are now discharging a number of lepers apparently cured. What this means may be gathered from a recent report of Dr. Henry Fowler, Secretary for Eastern Asia of the Mission to Lepers, recording what he has actually seen of the effect of the treatment in Korea. He found there not less than 100 to 150 lepers who had lost nearly every trace of leprosy, and those previously crippled were now strong and able to engage in various occupations, including making bricks and tiles, and various manual labour, such as carpentering by the men, while the women were doing household work. He thinks that within ten years, with properly organized treatment, 75 per cent. will recover. The main difficulty is the cost of providing the drugs for the continuous treatment for many months of the large numbers of lepers who are now flocking to the asylums where the treatment has been successfully carried out. At Kwangju, for example, thousands of lepers are anxious for admission, and great efforts are being made to cope with this urgent problem. On the other hand, the success of the treatment in enabling previously helpless lepers to undertake regular labour once more is being taken advantage of wherever land belonging to the asylums is available for cultivation as at Purulia. This should make them more largely self-supporting, so that with the proper organization of leper colonies, as is now being done in Bengal, the very success of the treatment should help to set free funds formerly spent on the maintenance of the helpless patients for the treatment of larger numbers. Another most encouraging feature is the number of comparatively early cases, in Hawaii and elsewhere, now coming forward voluntarily who formerly hid themselves as long as possible; this will go very far towards solving the hitherto immensely difficult problem of enforcing compulsory segregation among backward races, while the fact that so many of the treated cases become bacteriologically negative lessens materially the infectivity of the disease. Whether the new treatment ultimately proves to be a complete and permanent cure or not, it is already abundantly clear that it has opened up renewed hopes regarding the worldwide problem of the control of leprosy, and the great experiment of the treatment of 5,000 lepers at the Culion settlement of the Philippines, recently inaugurated by Dr. Heiser, will be watched with much interest as a conclusive test on a large scale of the recent advances. The immensity of the problem, however, can hardly be overrated in view of the extensive tracts of Asia, Africa, and South America affected by leprosy. To deal with these, very special efforts will be necessary, including the arousing of public opinion to the necessity for liberal financial support, so that the outcast lepers may receive the advantages available for them.

[3] *Deutsche medizinische Wochenschrift*, July 14th.

THE SMYRNA FIRE AND THE SMYRNA HOSPITALS.

THERE seems to be no official information so far as to whether the British hospital at Smyrna is among the institutions that have gone down in the great fire. Probably this is not the case, as it was close to the Aidin railway station at the northern end of the town, and this is known to have escaped; moreover, the hospital lies in considerable grounds, surrounded by a high wall. It consists of three independent blocks—main, administrative, and isolation—all built of stone and each of two stories. But though probably not burnt it is only too likely that its contents have been stolen, for it lies on the edge of a "Maltese quarter" which is one of evil repute. Since the war, during which it was occupied by the Turkish authorities, it had not been fully reopened as an ordinary hospital, but one of the blocks was being used as a maternity home for members of the British colony, and it is said that at the time of the evacuation three recently confined women were inmates. The institution, but not the building, is of very old date. It was founded in the seventeenth century by the old Levant Company of British Merchants, which also provided it with maintenance funds by imposing a "hospital duty" on all ships consigned to the company. When the company dissolved in 1825 it stipulated for the continued maintenance of the hospital on the same lines, and this has always been done. It is thus perhaps the oldest example of a rate-supported hospital. The present buildings were erected just a quarter of a century ago, but, curiously, maps of Smyrna published last week by some of the newspapers show the British hospital still in its original position close to the British Consulate. After the rebuilding it continued to receive free all seamen from British ships, but also did a good deal of surgical work for paying patients of all nations. Part of the "French Hospital" (an institution of much the same kind) is known to have escaped, but the Dutch, Austrian, and Greek hospitals were all in the area definitely known to have been destroyed. The Austrian and Greek hospitals were both large, the latter having a number of insane wards attached. There was also more than one Turkish hospital, and a small institution of a missionary order known as the Scottish Hospital for Jews, but we do not know if the latter had restarted work since the war. It is common to speak of the Turks as if they were still mentally a mediaeval nation. This, however, can scarcely be the case if the information given us some twenty-two years ago by an English medical man, then lately returned from a long visit to Smyrna, was well founded. During his stay an outbreak of plague occurred which the local authorities, all Turks, had dealt with very promptly and with a success which was all the more remarkable as at that time plague was far less well understood in Europe than it is to-day. Among the measures they employed was the

establishment of a bacteriological laboratory. All the workers therein were Turks, and the head of the laboratory, also a Turk, was described by our informant as one of the ablest young bacteriologists he had ever met, although he had received his education at the Turkish Medical School in Constantinople and had never been out of that city until sent to Smyrna.

THE MEDICAL SCHOOL OF MANCHESTER.

ON Wednesday, October 4th, the University of Manchester celebrates the jubilee of the absorption of the Royal School of Medicine, a privately owned institution, with Owens College, which in 1880 became the first college of the new northern university under the name of Victoria University, and was later joined by Liverpool and Leeds. It was not until 1883 that the university was empowered to grant medical degrees, and now 90 per cent. of the students take the Manchester degrees. The Manchester medical school cannot be said to have begun with any well-marked event, but from the foundation in 1752 of the Infirmary (of which Dr. E. M. Brockbank in his memoir of *The Honorary Medical Staff of the Manchester Infirmary (1752–1830)* has given many interesting details) private instruction was given to medical students, especially by Charles White, one of the greatest ornaments of the Manchester school, as was shown in the published tributes paid to him by the late Dr. C. J. Cullingworth and by Dr. J. G. Adami. In 1787 his son, Thomas White, also gave a course on the theory and practice of medicine, in the museum in his father's house. Peter Mark Roget, the author of the ever-useful *Thesaurus of English Words and Phrases*, lectured in 1806, probably in the same museum; and John Atkinson Ransome's lectures on the principles and practice of surgery at a later date (1824) appear to have been the first provincial ones recognized by the College of Surgeons of England. These lectures were given in Thomas Turner's school of medicine, which, like Joseph Jordan's school of anatomy and some others, came into being early in the last century, and were succeeded by the Royal School of Medicine. After Owens College was founded in 1851 it was felt to be incomplete without a medical school, but it was only in 1872, after long negotiations, that the Royal School was absorbed. The University of Manchester is marking this jubilee anniversary by a reception to inspect the medical school and the recent extensions of the laboratories, and has issued an interesting fly-leaf, from which some of the historical details mentioned above have been taken. On the same afternoon the Manchester Medical Society is holding an open meeting in the physiological theatre of the medical school, when Sir Humphry Rolleston, K.C.B., President of the Royal College of Physicians, will give an address.

CREMATION IN ENGLAND.

THE modern practice of cremation as a substitute for earth burial owes much to the efforts of medical men. The revival of this hygienic method of disposal of the dead was urged in the middle of last century by many eminent European physicians and chemists, and in consequence a congress was held in 1874 at Milan. In this country the pioneer in the public advocacy of cremation was Sir Henry Thompson, F.R.C.S., but for many years prior to 1874 (as duly recorded in the *Encyclopaedia Britannica*) Dr. Lord, Medical Officer of Health for Hampstead, had urged the practical necessity for the introduction of the system. In the beginning of that year steps were taken to found the Cremation Society of England. Among the leaders of the movement were Sir Henry Thompson, Sir T. Spencer Wells, and Mr. Ernest Hart, Editor of the BRITISH MEDICAL JOURNAL, the first-named being elected president and chairman of council on April 29th. In 1880 Sir Spencer Wells brought the matter before the Annual Meeting of the British Medical Association in Cambridge, and a petition to the Home Secretary for permission to adopt cremation was largely signed. This had at first no effect, and departmental obstruction continued; but in 1884 a judge, Sir James Fitzjames Stephen, declared cremation to be a legal procedure, provided no nuisance were caused thereby to others. In the following year the first cremation at Woking took place, and since then there have been upwards of 25,400 cremations in Great Britain. In 1893 the Home Secretary appointed a Select Committee of the House of Commons, presided over by Lord Ilkeston (then Sir Walter Foster, M.D., and a leading member of the British Medical Association), to inquire into the efficacy of the existing law as to the disposal of the dead. The present practice is governed by the Cremation Act of 1902 and the regulations made thereunder by the Home Secretary. In its last annual report[1] the Council of the Cremation Society of England records a gratifying increase in membership. An application for registration under the Companies Acts, sanctioned last year, has been submitted to the Board of Trade, which has approved the necessary Memorandum and Articles of Association. The Society continues to receive prominent medical support; among its Vice-Presidents are Sir Anderson Critchett, Sir Frederick Treves, and Sir John Tweedy (honorary treasurer), and the Council includes Sir Malcolm Morris and Dr. H. T. Herring. Nevertheless, progress is still very slow. At the present time less than 2,000 bodies are cremated annually in these islands; all the rest (some six or seven hundred thousand) are buried in the earth, and "every year the silent population of Greater London is increased by another hundred thousand."

THE HONG-KONG CHAIR OF MEDICINE.

IN our advertisement columns there appears this week a brief statement of the conditions attached to the newly created Chair of Medicine at Hong-Kong University, and prospective candidates may welcome some further information that has been supplied to us unofficially with regard to this appointment. The University of Hong-Kong was established in 1912 upon the initiative of the Governor of the Colony, Sir Frederick Lugard, and in 1921 received further endowment from the Colonial Government which has placed it on a secure financial basis. The university is for the education of Chinese students in European knowledge; its faculties are those of medicine, engineering, and arts. Wealthy Chinese have given generously towards its buildings and establishment, and British commercial firms in China have also made large contributions. The university has absorbed the old medical school that owed its origin in 1887 to the energy of Sir Patrick Manson, who laid the foundations of his great reputation in tropical medicine by work in Formosa and Hong-Kong. The Prince of Wales, during his recent tour in the East, was made an honorary LL.D. of the university, and on that occasion (April 7th, 1922) it was announced that the Rockefeller Foundation in America had resolved to give half a million Hong-Kong dollars (approximately £60,000) to the university for the creation of a modern school of medicine with professors in medicine and surgery who should devote their powers to teaching and research. A further donation of a quarter of a million dollars is in prospect for a chair of obstetrics when the school is ripe for this extension. Training for research into disease is plainly one of the aims which must be fostered by this Hong-Kong school of medicine. The great opportunities of the school were finely expressed by Sir Patrick Manson in his inaugural address as dean of the old college in 1887: "I can conceive of no grander position or opportunity for any man to have than that we offer here. At his back the whole of European science; before him 300,000,000 to whom to give it. Such a position must fire the ambition of anyone." The chair of physiology has been held for some time by Professor H. G. Earle, of Cambridge University, and that of pathology by Professor C. Y. Wang, M.R.C.P., who was educated at Edinburgh University and held a Carnegie Research Fellowship. The Rockefeller gift has enabled anatomy to be separated from surgery; the latter chair will

[1] *Transactions of the Cremation Society of England.* No. xxxiii, 1922. London: 52, New Cavendish Street. 1s., post free.

be continued by Professor Kenelm H. Digby, of Guy's Hospital, and anatomy will be taught by Professor J. Shellshear, D.S.O., of Sydney, Australia. In the appointment to the chair of medicine preference will be given to candidates not older than 35, and ability for teaching and research will be expected. A senior resident assistant and a resident house-officer are attached to the post. The election has been entrusted to a Committee at the Board of Education, Whitehall, which includes two of the recently appointed whole-time professors of medicine in the University of London. The salary is £300 a year, rising to £1,000, payable while the professor is in the colony at the rate of 2s. to the dollar (and in addition the university pays part of the insurance premium to the Universities Superannuation Fund). The salary may be supplemented by fees for consultations in the colony, but the expectation is that the professor will devote himself chiefly to the work of the school. There is no income tax in Hong-Kong, and local rates and taxes are almost negligible.

LIFE TABLES.

THE current issue of the *Journal of the Royal Statistical Society* contains the report of a discussion on the "Value of life tables in statistical Research," opened by Dr. Major Greenwood, and continued by several eminent medical statisticians and actuaries.[1] Medical officers of health who have regarded with envy those of their colleagues who could and did construct life tables will perhaps draw some comfort from the discussion, because most of the speakers were at no pains to disguise their opinions that nothing more could be learned from a life table, so far as the sanitarian was concerned, than from the death rates at ages. In the view of Mr. A. Henry, the Deputy Government Actuary, the great objection to the construction of life tables was that it allowed people to talk of "that quaintly designated thing, the expectation of life." It was, he said, a horrible term. It had no practical meaning, and it had caused more trouble in the minds of laymen, he thought, than almost any other actuarial function. He took it that the real reason for such measures as the life-table death rate and a standardized death rate was that people were not content to do the simple work of comparing the rates of mortality age by age. They wanted something in the nature of a composite picture of the whole table. They had variations in rates of mortality from the infantile to the oldest ages. They had variations in mortality which might go in opposite directions and react one against the other; and he suggested that Dr. Greenwood was perfectly right in saying that the only true comparison was a comparison either age by age, or, which he thought personally was more preferable, over short periods of the table, using the probability of living five to ten years, which might eliminate accidental errors. To a question of the opener, "What available information could be deduced from mortality data expressed in life-table form which was not afforded by the central death rates themselves?" Mr. Palin Elderton answered, "None." He was quite clear about that. His difficulty, he said, had always been this: he could not see why people could not be content with examining rates of mortality and comparing those rates between two tables and leaving it there. Dr. W. H. Hamer made a contribution to the debate which, even if its relevance to the subject be doubtful, is worthy of transference to our columns on its intrinsic merits. The evolution of the relationship of the statistician to the public health official was, he thought, very well illustrated in La Fontaine's fable of the miller, his son, and the ass: "The miller, of course, is the statistician, the son is the laboratory worker applying statistical methods, and the ass, as before, is the Medical Officer of Health. In the Victorian age, which, be it remembered, was an idealistic age, the miller and his son were so careful of the ass that they bore its weight upon a pole, which they carried on their shoulders; then certain critics said it must be set on its feet; then, again, in order to silence further criticism, and yet more criticism, first the son, and after that the miller, mounted upon the ass's back; then there was more trouble, for a fourth set of critics considered that the ass's life should be spared, and the miller and his son accordingly dismounted. The miller seemed more or less to acquiesce in this last arrangement. At all events, he was convinced that there had been too many changes, and he seemed to think that he, his son, and the ass had better settle down to business and get on with their journey. The moral of all this seems to be that each man must do his best, and no one, as La Fontaine says, can escape being criticized, whatever he does! 'Les gens en parleront, n'en doutez nullement.'"

[1] *Journ. Roy. Stat. Soc.*, lxxxv, 1922, 537.

PSORIATIC ARTHROPATHY.

OUR new contemporary, *Acta Radiologica*, representing the activities of medical radiology in Denmark, Finland, Norway, and Sweden, and containing articles in English, French, and German, is admirably got up and illustrated. In the first number there is an interesting record of a case of psoriatic arthropathy with excellent skiagrams of the hands and feet, which are specially welcome, as the only others that the author, Dr. S. Ström of Stockholm,[1] can refer to are those in a paper on the various forms of ankylosis by Ledoux-Lebard. The predominating change is bony destruction, often extending beyond the joints so as to leave small fragments only of some of the phalanges, while the other phalanges show atrophy. The hypertrophic changes described by French observers were insignificant. The skiagraphic appearances are said to resemble those in Raynaud's syndrome, sclerodermia, syringomyelia, and nerve leprosy, and therefore support the view that psoriasis has a nervous origin. Dr. Ström does not find any evidence in favour of Brock's hypothesis, based on improvement after the administration of stimulating doses of x rays to the thymus, that disordered internal secretion is responsible for psoriasis. Though very rare, the arthritic lesions in patients with psoriasis have attracted a considerable amount of interest, largely from their bearing on the nervous hypothesis of this common skin eruption. They are usually multiple, chronic, without any liability to cardiac complications, uninfluenced by salicylates, prone to attack the hands and wrists and to cause ankylosis, and have generally been regarded as belonging to the group of nervous arthropathies, a view now supported by Ström's radiograms.

[1] S. Ström, *Acta Radiologica*, Stockholm, 1922, i, 21-25.

THE VISCERAL CONTENT OF ARSENIC.

THERE is a general impression that arsenic when introduced into the body specially picks out certain organs—the liver and the spleen—and in 1919 Sicard explained the jaundice after treatment with salvarsan as toxic and dependent on a special affinity of arsenic for the liver. This belief, current long before Ehrlich's terminology came into vogue, may perhaps be regarded as an intelligent anticipation of his organotropy or special affinity of a drug for some one organ or tissue. Milian,[2] in a recent review of the available data on the quantitative distribution of arsenic in the viscera, combats the conception of any such selective localization; there is, he observes, a normal content of arsenic in the viscera which does not correspond with that found when arsenic is artificially introduced into the body. He argues that the visceral content of arsenic varies with the route by which it gains entrance to the body. Thus when the drug is taken by the mouth the maximum amount is found in the liver; but after intravenous injection of the arsenobenzol compounds the lungs and spleen show the highest arsenic content; an observation by Jeanselme makes it probable, he thinks, that the same holds true in the case of intramuscular injections of the arsenobenzol compounds.

[2] *Rev. de méd.*, 1922, xxxix, 385-391.

COD-LIVER OIL AND VITAMIN A.

RECENT INVESTIGATIONS.

A SERIES of papers has appeared this year which gives a large amount of interesting information concerning the source of the vitamin present in the cod's liver and the effect of processes of extraction upon this vitamin.

Experiments upon land animals have shown that these cannot synthesize vitamin A, and obtain their necessary supplies of vitamin from chlorophyll-containing plants, either directly, by eating green vegetable matter, or indirectly, by eating the milk or flesh of other animals. The investigations described below show that a similar process occurs in the sea and that the whole of the vitamin A required to support life in the sea apparently is synthesized by plants containing photocatalytic pigments. A peculiarity of the vitamin A exchange in the sea is that the main source of vitamins for deep-sea animals are the unicellular algae, and the vitamin is transferred through a series of animals of ascending size before it reaches large fish, such as the cod.

Jameson, Drummond, and Coward[1] showed that a marine diatom (*Nitzschia closterium*) grown in a sterile culture fluid synthesized large quantities of vitamin A. The research was interrupted by the sudden and untimely death of Dr. Jameson, but Drummond, Zilva, and Coward[2] traced the vitamin exchange farther, and showed that the plankton fauna, which lived on the diatoms, contained large amounts of vitamin A. This plankton, which consists largely of copepods and larval molluscs, is the source of the vitamin A which is found in large quantities in the livers of all fishes. The plankton forms the chief diet of a large number of marine animals, varying in size from minute fishes to whales; the cod, however, lives chiefly on small fishes; in the case of the cod, therefore, vitamin A is formed in diatoms and passes through two intermediate carriers—namely, the plankton and small fishes—before it reaches the cod.

A remarkable and very important point about the marine vitamin exchange is that the concentrations of vitamin A attained are much higher than occur on land. The following table shows the source of vitamin A and the approximate weight of substance in grams required to produce growth in rats weighing 100 grams:

Source.	Approximate Weight. Gram.
Marine sources:	
Diatom (*Nitzschia closterium*) (dry weight) ...	0.04
Plankton (dry weight)	0.1
Small fish (capelin, *Mallotus villosus*) ...	0.1
Cod-liver oil	0.003–0.01
Cod's roe (male)	0.025
Land sources:	
Green vegetables (cabbage) (dry weight) ...	0.1
Butter	0.1–0.2
Ox liver	0.25

The Manufacture of Cod-liver Oil.

Cod-liver oil was originally produced by the simple method of putting the livers into a tub, leaving them to putrefy, and skimming off the oil. This method produced an oil of rich golden brown colour, with a strong and objectionable taste and smell. Möller, in 1853, introduced the method of extraction by steam, and practically all the oil is now produced by this method. The oil thus produced is nearly colourless and has no smell, and only a slight taste.

There is a widespread belief that the modern oil is a less efficacious therapeutic agent than the old brown oil, and when the therapeutic action of cod-liver oil began to be associated with its high vitamin content it was suggested that possibly the modern methods of manufacture tended to destroy the vitamin. This question has been investigated by Drummond and Zilva,[3,4] who found that there was no evidence that the "steaming" method of production of cod-liver oil destroyed the vitamin A in the oil. Investigation in Norway showed that the cods' livers were removed from the freshly killed fish and were placed at once in vats, and the oil separated by low pressure steam (direct or indirect). The first fractions of the oil obtained, which are the only ones used for medicinal purposes, are nearly colourless, and the chief further refinement to which they are subjected is freezing to remove stearine. The latter fractions of the oil recovered by the "steaming" process are coloured, and a small amount of brown oil is still obtained by the "rotting" process. The authors conclude, however—

"After personal investigation of many factories, and careful interrogation of many sources of information, we came to the conclusion that very small and quite negligible quantities of crude 'brown' oils are refined to produce medicinal oils. Several processes for this refining have at one time or another been put forward in patents, but as far as we are aware none has proved of any commercial value on a large scale."

Experiments also were made to compare the vitamin content of the crude brown oils, of the colourless oils, and of oils prepared in the laboratory; in the last case every precaution was taken to prevent any destruction of the vitamin. From these experiments the authors conclude:

"From our exhaustive investigations of the effect of the modern processes of the preparation of cod-liver oil on its vitamin value we have formed the opinion that the 'steaming' methods yield oils of as high, if not actually higher, potency than were yielded by the old and almost extinct 'rotting' process.

"Further, the modern methods of refining, if we exclude, as we justly may, the almost negligible amount of bleaching of dark oils which occurs, scarcely affect the vitamin value at all.

"In the light of these observations it is obvious either that the popular belief that the 'dark' oils are more valuable as medicinal products than the modern 'white' oils is erroneous or that such beliefs arose at a time when some actual difference existed."

Sixteenfold variations may occur in the vitamin content of different samples of cod-liver oil, although even the least active samples of cod-liver oil contain more vitamin than does butter. Drummond and Zilva believe that these variations are a reflection of changes in the diet or in the physiological state of the fish at different seasons. The authors further note that the livers of other fish yield an oil as rich in vitamin A as cod-liver oil, and that therefore there is no obvious reason why the livers of other fish than the cod should not be used for medicinal purposes. They further question the utility of removing the stearine from cod-liver oil, as this substance is rich in vitamin A.

Tests for Vitamins.

The investigation of vitamins is, of course, greatly hampered by the fact that the only tests available for demonstrating their presence or absence are biological tests, which are difficult, expensive, and extremely tedious. A chemical test for vitamins would be of the greatest possible value, and it is interesting to note that Drummond and Watson have discovered indications of the possibility of such a test for the vitamin A present in cod-liver oil. Cod-liver oil dissolved in chloroform or carbon bisulphide and shaken with a drop of sulphuric acid gives a violet-red coloration, and this is one of the old pharmacopoeial tests (U.S.P.) for cod-liver oil.

Drummond and Watson[5] examined a series of fish oils and found that their vitamin content varied about tenfold, and that the intensity of the colour reaction also varied greatly, and they showed that the variations in the vitamin content and in the intensity of the colour reaction were roughly parallel. They also showed that the passage of air through cod-liver oil at 100° C. slowly destroyed the vitamin A present, that the colour reaction was abolished by the same process, and that the vitamin and the chromogenic substance disappeared at the same rate. They conclude that—

"The few properties of the (chromogenic) substance which are known, as well as the available data regarding its distribution in natural products, show certain resemblances to the unidentified dietary product known as vitamin A; and, without assuming the identity of the two factors, it is suggested that the association may be of some significance."

There is no doubt that the work reviewed in this article greatly increases our knowledge of the vitamin A in cod-liver oil. The definite evidence as to the origin of the vitamin and the way in which the vitamin is passed through different classes of the marine fauna until it finally reaches the cod reveals an aspect of deep-sea metabolism which is of great interest. The evidence as to the influence of manufacturing processes upon the vitamin in cod-liver oil is most important, and also rather unexpected. Finally, the suggestion that it may be possible to find a chemical quantitative test for vitamin A is of the greatest importance, for such a test would facilitate enormously the investigation of vitamins.

[1] H. L. Jameson, J. C. Drummond, and K. H. Coward: Synthesis of Vitamin A by a Marine Diatom, *Biochemical Journal*, 82, xvi, 1922.
[2] J. C. Drummond, S. S. Zilva, and K. H. Coward: Origin of Vitamin A in Fish Oils and Fish-liver Oils, *Biochemical Journal*, 518, xvi, 1922.
[3] S. S. Zilva and J. C. Drummond: Fish-liver Oils and other Highly Potent Sources of Vitamin A, *Lancet*, 1922, i, 1243.
[4] J. C. Drummond and S. S. Zilva: The Preparation of Cod-liver Oil and the Effect of the Processes on the Vitamin Value of the Oils, *Journal of the Society of Chemical Industry*, 280, xli, 1922.
[5] J. C. Drummond and A. F. Watson: The Sulphuric Acid Reaction for Liver Oils, *Analyst*, August, 1922.

THE MANSON MEMORIAL MEDAL.

PRESENTATION TO LADY MANSON.

THE presentation to Lady Manson of the first medal struck in memory of the late Sir Patrick Manson took place at the London School of Tropical Medicine on September 26th.

Major-General Sir WILLIAM B. LEISHMAN, F.R.S., addressing a small company, which included several of Sir Patrick's most distinguished associates, gave a brief history of the Manson Memorial Fund, the proceeds of which, in part, have gone to the issue of the medal. He said that it was the feeling of many of those connected with the School that a worthy portrait of Sir Patrick Manson should be secured for its walls. Nothing in the nature of public appeal was made, but in response to letters to Manson's old friends and fellow-workers subscriptions came in from all parts of the world, and the letters accompanying the subscriptions were remarkable alike for the eminence of some of the writers and for the personal tributes which they contained. As a result of this private and narrow appeal about £300 was collected in a very short time, an amount considerably greater than was necessary to secure the portrait in question and to have mezzotint reproductions of it made for presentation to all the subscribers. The committee of the fund, of which the speaker was chairman, decided that the balance should be devoted to the striking of a medal, to be known as the Manson Memorial Medal, and to be presented triennially to any workers who gained special distinction in tropical medicine. It was a graceful thought on the part of the governing body of the School that the first medal should be presented to Lady Manson. This presentation was not meant as a mere empty compliment. The governing body felt that the first medal would properly be given to a lady who had personally done a great deal to further the cause of tropical medicine. In more than one way could a wife help her husband in his work. Some wives were able to assist in the direct way, as, for instance, by association in laboratory research; but there was an indirect way at least as important and helpful as the other. As a man most fortunately married himself, he (Sir W. Leishman) knew in how many directions a man's work could be helped by his wife, merely by the creation of a sympathetic atmosphere, perhaps by a little word of flattery when others outside were engaged in criticism, and especially by encouragement in times of difficulty or failure such as came to every research worker. In these respects the stimulus given to a man by his wife was very real indeed, and in all of them Lady Manson had shown her devoted skill, so that her contribution to the science which made her husband famous was nothing small.

Sir William Leishman then handed the medal to Lady Manson with the warmest congratulations and good wishes of the School.

Dr. P. H. MANSON-BAHR said that Lady Manson had asked him, her son-in-law, to reply on her behalf. She wished to thank Sir William Leishman and the School from the bottom of her heart. This was one of the greatest compliments which could have been paid her. The medal would be among her most treasured possessions and an heirloom in her family. She was especially gratified, because this medal was also commemorative of the London School of Tropical Medicine, which Sir Patrick Manson, their revered master, did so much to create, and the welfare of which was uppermost in his mind to the very last day of his life.

The medal presented to Lady Manson is in bronze, and (as our reproduction indicates) it bears on its obverse a very fine portrait in relief, doing justice to the rugged face. On the reverse are the words "London School of Tropical Medicine." The medal, which is to be presented to distinguished workers in this subject, will bear on the reverse a device embodying "Tropical Medicine and Hygiene," in recognition of the fact that the recipients will be selected by the Council of the Royal Society of Tropical Medicine and Hygiene. The medal is the work of Mr. J. R. Pinches, of Albert Embankment, London, who was fortunate enough to obtain a special sitting for his purpose only a few days before Sir Patrick Manson's death. The medal, therefore, which was greatly admired, is a more sympathetic interpretation of the man than is usual with medallic designs which are reconstructed from photographs. A large oak-framed plaque in bronze, bearing the same design, is placed in the library of the School. It was from this large model that the photograph we reproduce was obtained.

Nova et Vetera.

HONORARY GRADUATION IN THE OLDEN TIME.

THE seventh centenary of the foundation of the University of Padua was celebrated last May with becoming pomp and ceremony. Ambassadors of science from the ends of the earth graced the high festival, and these in turn were honoured by the laureation of some of the most distinguished among them. Such ceremonial degrees are, however, no novelty to us of the present day, and to most their bestowal at Padua would not give rise to a second thought. In the minds of those who fetch their precepts from the Cynic tub there may indeed have risen a doubt as to how far time would set the seal of its ultimate approval upon Padua's choice. From the past we may at least glean some suggestions towards an answer. Three chance samples from the Cinquecento may not afford a broad enough basis for a generalization, but, in any event, the details are not without an interest of their own.

In the beginning of October, 1515, Pavia welcomed a band of strangers from across the Alps. No peaceful pilgrimage this, but a roystering array of French knights, their swords still reeking with Italian blood. Some days before, Francis I had won the sanguinary battle of Marignano against the Milanese, and therefore did Pavia mightily rejoice. Every citizen vied with his neighbour in doing honour to their liberators, and the university was anxious to play its part. It so happened that among the suite of the Duke of Lorraine was his surgeon, Symphorien Champier by name, a graduate of Montpellier, who, after a distinguished career as a practitioner and town councillor at Lyons, had donned a coat of mail and emulated the feats of his wife's cousin, Bayard. So valiantly had he acquitted himself in this capacity that the golden spurs of knighthood were granted him by the duke on the field of battle at the very moment that Francis I received from Bayard a similar honour. But, though his patent was but a fortnight old, Champier had seen forty-four summers, and the harvest of his intellectual activity was already represented by seventeen printed volumes—a veritable encyclopaedia in black-letter. To him, therefore, the university resolved to give an honorary degree, and to his indefatigable pen we are indebted for a record of the proceedings.

"Patres optimi," began the dean, Rusticus of Placentia, "rejoice, yea, rejoice again and again, and be glad, ye, whose names are written abroad through the world! Rejoice and be glad in the first place, that after the fears and agitations of these many years had forged a chain of death about us there has come amongst us the most invincible and most Christian Francis, King of the French and our own Duke. He shall wipe away every tear from our eyes, nor shall there

be any more grief or lamentation or sorrow. The sun of alien oppression shall no longer burn us up, and all things shall be made new. Rejoice in the second place, and be glad, because Symphorien Champier is about to enter our ranks, a man, among the learned most learned, among the most learned most excellent, and among the most excellent most eminent. Noble in family and fatherland, he is still more noble in his valour, and most noble of all in his learning."

We need not follow the orator through the rest of his speech, which is pitched in the same key. The final invitation to the graduand runs thus: "Come, then, O effulgent gem! Advance, O priceless pearl, whose wife is a pearl of beauty!" (Her name was Margarita.) "Come, father and brother, and deign to accept the highest honour we can bestow, although its acceptance is a greater privilege to us than to you. We pray that your days may be happy and that you may always remember the learned men of this college, who for their part will never forget you."

The next ceremonial we will relate occurred in the same hall a few days later, and again Champier gives us the details, *quorum pars magna fuit*. Among the French nobles at Pavia was the brother of Monseigneur de Lorraine—namely, the Duke of Guise, first of that line, and destined to be the grandfather of Mary, Queen of Scots. He had in his train a barber-surgeon, a Picard called Hyppolite Daultreppe, who eagerly desired academic distinction. Accordingly he besought Champier to persuade the Faculty to grant him the degree of Doctor of Surgery. Champier's new friends at once acceded to his request and no less than twenty-two appeared to lend dignity to the proceedings. At the outset, however, a very serious difficulty arose when it was learned that Daultreppe had no Latin, and that even "Frensch of Parys was to him unknowe." The Professor of Medicine voiced the universal indignation. "We are astounded, Messire Champier," cried he, "that you have asked us to assemble here, as we have done in such large number, to grant a degree to a man who is destitute of knowledge and has not even a smattering of Latin. We can only assume that you wanted to trick us or make us look foolish." But Champier was equal to the occasion. "Brother and colleague," he replied, "tell me this: if Galen and Avicenna were alive to-day, and came to you and asked for a degree, would you grant it them?" The answer was, "Certainly! such men could not be refused." "Note this, then," continued Champier, "that neither knew Latin, though both were most distinguished physicians. A particular language is, therefore, not an essential to knowledge, since this can be acquired through the medium of other tongues, even through Arabic which we regard as barbaric." He then went on to argue that the real test in this case was the surgical attainments of Daultreppe, and these they could ascertain at once by using him as interpreter. The disconcerted assembly at length accepted the offer and the interrogation began. Champier translated the questions to Daultreppe, and then rendered his answers into Latin. All difficulties were surmounted with such consummate ease by the candidate that the doctors were astonished into silence. It is clear that they were not without suspicion that most if not all the learning displayed in the answers came from the stores of the interpreter. This, however, was too delicate a matter for them to probe, and so the Picard got his degree.

Like Daultreppe, the third subject for consideration was a Frenchman, who as a barber-surgeon had accompanied an army into Italy. He too had given distinguished service to a Guise—Francis, the second duke—snatching him from the death which was later to reach him by an assassin's hand. In his case Pavia would not have been so sore distraught, for though he lacked Latin he knew Italian fairly well. Him in 1554 the French King desired to honour with a degree. It would appear from the subsequent open enmity of the medical faculty against the man that with them the King's wish was of no avail. Fortunately the College of St. Cosmas was complaisant, but here again the difficulty in regard to Latin arose. At length by special vote the rule was for once suspended, and the candidate passed through the successive grades of Bachelor, Licentiate, and Master of Surgery at intervals of only two months.

Now what is the verdict of posterity on these three men? Of Champier's final reckoning of fifty volumes the rare copies that still exist

> "at peace remain,
> Amid their kindred cobwebs in Duck Lane."

Daultreppe swims into our ken with that scene at Pavia, but of him no more. Of the last it is only necessary to mention that his name was Ambroise Paré.

But we must not judge the past too harshly or expect too much from the present. Like other human institutions, universities are liable to err in their choice as in their rejections. But corporations have no souls. This is fortunate for universities, since all of them have much to regret.

G. M. C.

England and Wales.

Opening of the New Session in London.

Next week will see the opening of the new winter session at the London medical schools. At St. Bartholomew's Hospital Medical College the occasion will be marked by the holding of the annual old students' dinner at the Hotel Victoria on the evening of October 2nd. At Charing Cross Hospital Medical School the prizes will be distributed on October 3rd at 3.30 p.m. by Viscount Burnham, and the annual dinner will be held that evening at Oddenino's Imperial Restaurant, Regent Street. Sir Clifford Allbutt will give the inaugural address at St. George's Hospital Medical School on October 2nd at 3 p.m. At Guy's Hospital Medical School there will be no formal ceremony on October 2nd, but the new anatomy and biology buildings will probably be completed during this session, and will be opened next summer. At King's College Hospital Medical School the introductory address will be given by Sir Herbert Jackson on the afternoon of October 3rd, and the annual dinner of past and present students will take place that evening at the Café Royal, Regent Street. The introductory address at the Middlesex Hospital Medical School will be given at 3 p.m. on October 3rd by Professor Sidney Russ, the prizes will be distributed by H.R.H. Princess Alice, Countess of Athlone, and the annual dinner will be held that evening at the Trocadero Restaurant. At Westminster Hospital School of Medicine Mr. G. T. Mullally will give the introductory address on October 2nd at 3 p.m., and the annual dinner will be held in the evening at the Wharncliffe Rooms. The annual dinner of past and present students of St. Mary's Hospital Medical School will take place at the Connaught Rooms on October 2nd at 7.30 p.m. The session at St. Thomas's Hospital Medical School begins on October 3rd, and the old students' dinner will take place at Princes' Restaurant on November 10th, with Sir Charles Sherrington, President of the Royal Society, in the chair. Viscount Burnham will give the introductory address at the London (Royal Free Hospital) School of Medicine for Women on October 2nd at 3 p.m.

Milk Prosecutions.

We have received the following statement from the Public Information Branch of the Ministry of Health:

Health Ministry and Milk Prosecutions.

"Efforts are being made in a number of quarters to misrepresent Circular 325, issued two months ago by the Ministry of Health, advising local authorities to forbear in certain clearly defined circumstances from the prosecution of milk vendors. The Circular is rarely quoted as a whole, and in view of the fact that sentences torn from their context have been used to suggest falsely that the Ministry is tolerant of laxity in the production of milk it becomes desirable to restate what the Circular does and does not advise.

"It is based upon an actual case of unsuccessful prosecution by a local authority of a milk vendor who was charged with selling milk deficient in fat. In the Court it was shown that the vendor had held a good record for a number of years, and that repeated tests of his milk during that time had given uniformly satisfactory results; also, that 'special circumstances existed to account for the milk being deficient in fat on the occasion of the test on which the prosecution was based.' It was stated that the local authority had made no attempt before prosecuting to ascertain why on this isolated occasion the milk had failed to pass the test, and that the vendor had not volunteered the necessary information. But when the facts were revealed in Court the local authority at once withdrew the prosecution.

"The advice given in the Circular is expressly limited to cases in which the circumstances are similar to those described. It states that 'the Minister is of opinion that it is extremely undesirable that a prosecution should be based upon the results of an isolated test *when other tests of the particular milk supply have proved satisfactory*'; and it suggests that '*in such cases* prosecution should be instituted only where a series of tests have shown repeated default.' It is therefore incorrect to represent that the Circular has any general application. The only cases in which it deprecates the institution of a prosecution 'based upon the results of an isolated test' are those in which a milk vendor has held

a consistently good record for a number of years during which his milk has been constantly tested with uniformly satisfactory results."

Readers who turn to the article in our issue of August 5th (p. 232) on milk prosecutions, and to the paragraph with the same title on August 19th (p. 325) referring to the action taken by the Society of Medical Officers of Health, will be in a position to judge the value of the defence now put forward by the Ministry of Health.

RED CROSS ACTIVITIES IN LONDON.

The annual report of the County of London Branch of the British Red Cross Society shows that, although the activities of the Society are less obvious in times of peace than in war, they are being directed into channels of considerable value to the community. The Red Cross clinics which have been organized in London have attained a high degree of success; the work of the clinics has assumed dimensions far greater than was anticipated, and the gratitude of the men who have been treated at them is a testimony to their value. At the end of last year ten clinics were open in the County of London, and five of them had tropical disease branches; in 1921 there were 142,831 treatments given in excess of those of the previous year, and the total treatments since the clinics opened amount now to considerably over half a million. Besides work at the clinics and Red Cross institutions, at all of which members of the Society are giving voluntary assistance, members have worked in various capacities in several civil hospitals and other institutions for the sick and disabled. As an example, the Camberwell Division during 1921 did very useful work in connexion with King's College Hospital; a scheme was initiated after the war by which members of the detachments helped the hospital by visiting homes of in-patients prior to their return, and explaining what arrangements were necessary for them, by visiting discharged in-patients and casualty patients after treatment in the hospital, doing clerical work at the hospital, making and mending garments, etc. The Division has also recently entered upon another sphere of usefulness in connexion with the Hostel for Crippled Working Girls, Denmark Hill; many of the girls in this institution have to pay regular visits to various hospitals for treatment, and they are escorted to them by members of the Division. At Greenwich and Woolwich Red Cross members work at local welfare centres, and assist district nurses; several members of the Marylebone Division are still working in hospitals in the evenings and week-ends, and similar voluntary work is carried out by members of other divisions in London. The Westminster School Treatment Centre may be given as another instance of the work of the society. This is the first of its kind opened in London; it is organized under the auspices of the Westminster Division for the treatment of minor ailments among children attending elementary schools; there has been an average weekly attendance of 147 children, the new cases averaging 14 a week. The medical supply dépôt established by the Camberwell Division has been found to be so useful that other dépôts were established in various parts of London for the benefit of poor persons, with the aid of grants by the executive committee of the Branch. From these examples it will be gathered that Red Cross work in London is still very much alive, and there are many members who give a very large measure of their time and services to keeping the work going.

Scotland.

THE VITAL STATISTICS OF SCOTLAND FOR 1920.

THE Scottish Registrar-General's Report for 1920 has been mentioned in the JOURNAL of July 29th (p. 176), and again on August 26th (p. 399). We now give a fuller account of its contents. The population of Scotland in the middle of 1920 is estimated at 4,864,396, the estimate being safely based on the census of 1921.

Births.

The births numbered 136,546, the maximum since registration began; they were 30,278 in excess of the previous year, and 22,592 more than the mean of the previous ten years. The rate was 23.07 per 1,000, or 4.17 above the average of the previous ten years and higher than any year since 1908. The rise began in September, 1919, and reached its maximum of 32.2 in March, 1920, then gradually subsided to 25 in September. Illegitimate births to the number of 10 204 were registered, a larger number than in any year since 1887; the rate was 7.47 per 100 births, very slightly above the mean of the preceding ten years.

Marriage and Divorce.

The marriages registered were 46,843, also a record, being 2,783 more than in 1919, 11,511 more than the mean of the previous five years, and 12,781 more than the mean of the ten preceding years. Also they are 13,167 more than the maximum in any year previous to the war. The rate, 9 63 per 1,000 of population, was likewise a record, being 1.86 more than 1873, the pre-war record holder.

In the number of divorces there has been an astonishing increase. The total in the year was 776, or one to 60 marriages. Fifty years ago (in 1870) the ratio was one in 1,403. The minimum was in 1864, when there were only two divorces, and 1865 and 1866 had only four each. The figures have never fallen below 100 since 1890, in 1918 they reached 485, in 1919 829, and in 1920, as already stated, 776. These last two years between them have had more divorces than the thirty-seven years 1855 to 1891 inclusive.

Deaths.

Deaths registered numbered 68,179, or 5,645 less than the mean of the previous ten years, and yielded a rate of 14.02, the lowest yet recorded for Scotland, the previous lowest having been 14.45 in 1917.

The infantile mortality rate was 92 per 1,000 registered births, also a minimum for Scotland, and 15.9 less than the mean of the ten preceding years, the previous minimum having been 97.1 in 1916. In the last five years an infantile mortality rate of less than 100 has been recorded three times. Previous to 1916 it was constantly over 100, and only exceptionally under 110. At the other extreme of life the ages of nine reputed centenarians were verified, and in the course of eleven years 59 such verifications have been made. Among causes of death small-pox and cancer were unusually prevalent, the former being registered in 152 cases, or more than in any year since 1904. Deaths from cancer have had a new maximum in 1920, the number being 5,765 and the rate 119 per 100,000 population; fifty years ago it was 43. On the other side of the account we find that the phthisis rate fifty years ago was 283 and is now only 85. In fact, phthisis and all forms of tuberculous disease, likewise whooping-cough, reached their lowest recorded death rate in Scotland in 1920, whilst the measles rate was lower only in three previous years—namely, in 1879, 1886, and 1894. Similarly the diphtheria death rate of 1920 was less than in any previous years excepting 1903, 1905, and 1917. The death rates from all tuberculous diseases were less than a third of what they were fifty years ago.

Vaccination.

As to vaccination, of the children born in 1919 and reaching the statutory vaccination age only 58 per cent. were reported successfully vaccinated. That is somewhat better than in the previous year, but prior to 1907 (the year of the last relaxation of the law of vaccination in Scotland) the rate was constantly over 90, and often over 95 per cent.

Additional Details.

The above figures are taken mainly from a condensed general account with which the Registrar-General conveniently begins his Report. He then proceeds to fuller detail from which some further notes may be made.

Births.—The ratio of male to female children was 104.3 to 100. In the counties including burghs the birth rate varied from 32.3 in Linlithgow and 31.9 in Lanark to 16.8 in Argyll and 17.3 in Bute. In the group of "larger burghs" (with 30,000 inhabitants or more) the birth rate was 30.18 per 1,000, in the smaller burghs (under 30,000) 27.37, and in the county districts 25.52. The highest rate in the larger burghs was in Hamilton, 34.1, and the lowest in Perth, 24.1. In the smaller burghs the rates varied much more—from 43.3 in Rothes to 9 8 in Melrose, but of course in small populations there is more room for chance variation owing to paucity of data. In county districts the highest rate was 34.4 in the Middle Ward of Lanarkshire, and the lowest 10.3 in the Cowal District of Argyllshire. Calculated on the number of women of child-bearing age, the birth rate per 1,000 of such women was 116.6, or 23.4 more than in 1919, 32 8 more than in 1918, and 33.2 more than in 1917. In the larger burghs the rate ranged from 165 in Coatbridge to 88 in Edinburgh.

Illegitimacy has diminished with passing years. During the period 1852-57 the numbers annually were always over 10,000, then up till 1919 they were always under 10,000, and the minimum (7,295) was reached in 1917. The illegitimate rate as a percentage of the total birth rate differed remarkably as between one area and another. The county districts are higher (8.64) than the

larger burghs (6.99) and the smaller burghs (6.94). In certain counties—Moray, Banff, Aberdeen, and Caithness in the north and Wigtown and Kirkcudbright in the south—the illegitimacy rates are exceptionally high, whilst in Dumbarton, Renfrew, Orkney, Fife, and Linlithgow they are very low. Whether the figures represent a corresponding difference in morality is another question. Of the total children born in Scotland 2.67 per cent. were twins (3,644 children) and 0.03 per cent. (45 children) were triplets. A table of monthly birth rates is given for the years 1914–20, showing the influence of the war. The rate, which, as it happened, had been rather high in the winter of 1914–15, began to fall below the pre-war average from about the middle of 1915, and continued so right on until October, 1919. It rose to a maximum in the winter 1919–20, then declined again, though not quite falling so low as the pre-war average, up to the end of 1920.

Marriages.—In the counties in 1920, including burghs, the rates varied from 12 per 1,000 of population in Midlothian to 4.1 in Argyllshire. A table is given to show the monthly marriage rates as influenced by the war, from August, 1914, till the end of 1920. Up to the end of 1917 the rates were very irregular, 22 months being above the pre-war average, and, interspersed with them, 19 months below it. In May and November, 1915, and May, 1916, the rates were exceptionally high. In the three years 1918–19–20, all but five of the 36 months are above the average, the highest rates being in May, 1919, and May, 1920, when the pre-war average was exceeded by 89 per cent. and 111 per cent. By December, 1920, the excess had diminished to 7 per cent.

Deaths.—Here we will only call attention to the Registrar-General's method of recording his facts. Three kinds of death rate are stated throughout the Report: (1) crude, (2) corrected, and (3) corrected and adjusted. The crude rate represents the number of deaths actually occurring in an area, the corrected rate is based on the deaths belonging to the area whether they occur within or beyond its bounds, and the adjusted rate compensates for differences between the age and sex distribution of the area compared with that of Scotland as a whole. From a table of the rates in the larger burghs two illustrations of the method may be given. In Clydebank the crude rate was 8.3, the corrected rate was 11.6, and the adjusted rate 13.4. Clydebank has very little institutional accommodation; its accidents and many other cases go to Glasgow, and when such deaths are debited to Clydebank its 8.3 becomes 11.6. Then the age composition of its population is favourable, the proportion at healthy periods of life being high. When that is taken account of, and the standard applied is the age constitution of the whole of Scotland, the adjusted death rate emerges at 13.4. On the contrary the city of Perth receives into its institutions from the surrounding country many cases which die within its bounds but do not belong to it. When these are allocated to their own areas the crude death rate, which was 16.6, is reduced to a corrected rate of 14.4, whilst a further trifling reduction owing to age constitution gives an adjusted death rate of 14.1, or only 0.7 above Clydebank's, whereas its crude death rate of 16.6 was exactly the double of Clydebank's 8.3.

In concluding this notice we would only point out that the minimum death rates and infant mortality rates which Scotland has experienced in 1920 are still very definitely higher than those of England. What the causes are cannot be discussed here and now, but attention may be called to the facts as to housing stated in our notice of the Census of the Four Great Towns of Scotland in our issue of August 26th (p. 399).

EDINBURGH ROYAL MATERNITY HOSPITAL.

At the monthly meeting of directors of the Edinburgh Royal Maternity Hospital, held on September 19th, Dr. T. G. Nasmyth, chairman of the board, cordially welcomed Dr. B. P. Watson, the newly appointed professor of midwifery and gynaecology, who, under the arrangement between the university and the hospital, is *ex officio* a director of the latter. Professor Watson was further placed in charge of the hospital for the quarter beginning October 1st, with Dr. Oliphant Nicholson as assistant physician. Dr. J. W. A. Hunter was appointed senior house-surgeon and Dr. J. A. Douglas junior house-surgeon for the same period; the resident medical officers in the ante-natal department (under Dr. Ballantyne) were Dr. Rosemary O. Morris as senior and Dr. Ruth Ritchie as junior. The statistics of the hospital for the month of August were: Deliveries—intern, 168, extern, 80; at Leith branch, 31; total, 279. Attendances at ante-natal clinics—new cases, 115; revisits, 205. Attendances at venereal disease clinics—new cases, 15; revisits, 114.

Jamaica.

THE CENSUS OF 1921.

As it was not under a labour strike, Jamaica was able to have its 1921 census in April. Its population was found to be 858,118, an increase of 26,735 since 1911. But of the total increase no less than 22,201 was in the female population, and only 4,534 in the male. The males numbered 401,973, and the females 456,145, or 113.4 per 100 males. The total intercensal increase was 3.2 per cent. As the rate of increase between 1911 and 1921 had been assumed to be a continuation of the rate which belonged to the period 1891–1911, when the growth had been much more rapid, the calculation for April, 1921, was 46,313 in excess of the census facts—an example of the danger of that method of estimation. Evidently the excess of overseas departures above arrivals had been very incompletely reported to the authorities during the last decade. The population on shipboard at the census was 1,266, nearly half at Kingston. The British army population was 1,063 officers and men. The town of Kingston had 62,707 inhabitants, as against 57,379 in 1911. The next largest centre, Halfway Tree and vicinity, had a population of 25,337. The average number of persons per inhabited dwelling was 4.4. One-roomed houses increased to 80,654 from 75,670, but the criteria of housing are roofs—shingle, metal, concrete, or thatch—and the presence or absence of floors of concrete or wood. The best class has increased 20.5 per cent., the second class has decreased 1.8 per cent., and the lowest has decreased 22.3 per cent. Of the total population 17.2 per cent. consisted of married persons in 1921, as against 18.8 per cent. in 1911.

The population is divided into white, coloured, black, East Indian, and Chinese. There was a slight diminution in the number of the whites, from 15,605 to 14,476 in the ten years; their percentages to the total population were 1.88 and 1.69 respectively. Blacks, East Indian, and Chinese increased. A table of occupations shows that nearly one-half (48.3 per cent.) are classified as "indefinite and non-productive," but it is explained that these include children under 5, and many up to 14 years. Agriculture is the main occupation, and is followed by 33.3 per cent. of the population; the industrial class forms 8.6 per cent., domestic 6.1, commercial 2.4, and professional 1.3. Among the agriculturists bananas occupy the most workers; sugar comes next. Planters have increased from 112,542 to 129,312. Of persons from 5 years upwards 52.1 per cent. could read and write, 8.7 could read only, and 39.2 were unable to read. Of the total population 2,403 were born in the United Kingdom, and 2,264 were of British parentage.

The Registrar-General of Jamaica, Mr. David Balfour, is to be congratulated on having succeeded in obtaining so much interesting information for his census report.

Correspondence.

EXPERT WITNESSES: SURGICAL AND MEDICAL.

SIR,—May I be allowed to offer my support to Mr. C. H. Fagge's letter on Clayden *v.* Wood-Hill (September 16th, p. 531), bringing to the notice of your readers the vital importance to those who practise medicine of moving in the direction indicated in his "second point," where he speaks of "the hopelessness of the present method of employing medical experts on both sides of a case" and the disadvantage of calling medical evidence "for the plaintiff *and* for the defendant"? The defendant is usually the doctor who is the first to attend the plaintiff, and he has more intimate knowledge of all the circumstances and conditions of the patient than the medical experts who give their opinion for the plaintiff sometimes in support of an allegation of negligence in treatment. The plaintiff is entitled to be treated with due knowledge and, if there be negligence, he is likewise entitled to receive scientific and unprejudiced support from medical experts to establish his claim for damages. But the question that one so very frequently hears, and one that has for some time past aroused widespread feeling, is, Has not the time arrived when steps should be taken to put the trial of such cases upon a more scientific basis than that existing at the present time?

The British Medical Association, when it considered that injustice had been done, has always supported members of the profession whether members of the Association or no; it has fought for the principle of equity. It is to be remembered that cases of alleged negligence are not confined to the practice of surgery, and experts in the various branches of practice may be called upon to give evidence.

It may be of interest to those, like Mr. C. H. Fagge, who are invited to give expert evidence in cases of alleged negligence, to record my own experience when asked to give such evidence as a surgeon. For a time I flatly refused to see or have any

correspondence with a potential plaintiff, but on reconsideration I came to the conclusion for reasons I need not here state that it was not fair to a plaintiff who believed that I had special knowledge of the particular surgical conditions of the case. I therefore performed a *volte-face* and gave to the plaintiff the usual welcome I gave to ordinary patients; I took full notes of the case, and when my examination was finished I said: "I will send a copy of the notes I have taken to your doctor, and will ask him to come and discuss your case with me, so that I shall have full inside knowledge before deciding whether I can support your claim." I think I must have lost caste as a medical expert after adopting this plan, but I consider it to be the correct one, and believe that it might with advantage be imitated until the time arrives when Mr. C. H. Fagge's opinion shall fructify and it is generally recognized that "the present method of employing medical experts on both sides of a case . . . should be discontinued."

If the British Medical Association would take the initiative in organizing a committee, say, of its own body, with representatives from bodies granting qualifications to practise medicine, may I suggest that the body which appoints nautical assessors should be consulted with regard to the practice now existing in the Admiralty Court?

If the present persecution continues in respect to the results of the treatment of injuries to bones, the time will soon come when it will be wise for general practitioners to send all such cases to hospitals.—I am, etc.,

September 19th. JOHN LYNN-THOMAS.

OPHTHALMIC EXAMINATIONS IN GENERAL MEDICINE.

SIR,—I will ask your permission to say a word in support of Dr. Tyson's commendation (p. 578) of the routine use, in clinical examinations, of the electric ophthalmoscope. To those to whom this form of ophthalmoscope has been of continuous service for a number of years it may at first sight seem superfluous at this time of day to speak of its values. Yet there is plain evidence of the existence of considerable areas of professional practice where these values are either unknown or ignored. One of the most impressive testimonies in this direction may be found in the recent issue of a volume on "ophthalmology," addressed to that much-exhorted person the general practitioner. The author warns his readers that "all detailed ophthalmoscopic examination is practically impossible for the general practitioner," on account, *inter alia*, of hindrances to the inspection of the fundus "in the shape of various reflections from the mirrors, cornea, etc." But of the electric ophthalmoscope and of the ease and simplicity this instrument has lent to ophthalmoscopic examination our counsellor and guide has no information to offer. Against his counsel of despair I will select two relatively ancient quotations, the first from a review printed in your own columns:

> "There is nothing inherently difficult in the use of the ophthalmoscope . . . and with a little practice any man of ordinary ability can acquire sufficient proficiency to diagnose gross changes in the fundus—such conditions, for example, as optic neuritis, optic atrophy, albuminuric retinitis, disseminated choroiditis, and massive haemorrhages."—BRITISH MEDICAL JOURNAL, July 4th, 1914.

And in relation to the electric ophthalmoscope:

> "On a recent occasion when the All-India Sanitary Conference met in Madras a number of its members, who had not touched an ophthalmoscope for many years, were shown the fundus with an electric ophthalmoscope as simply and easily as they could have been shown a picture hanging on a wall through a hole in a partition. Not only so, but it is our practice to demonstrate the fundus with this instrument to lay visitors to the hospital."—Colonel R. H. Elliot, F.R.C.S., in *The Ophthalmoscope*, March, 1913.

This in 1913, and yet in 1922 one of our pastors and masters, ignoring the ophthalmoscope in its modern form, tells us from his pedestal that for the great majority of the profession ophthalmoscopic examination is "practically impossible." Evidently, therefore, Dr. Tyson's advocacy is by no means redundant or out of date. If I may add a personal word I would say, for numerous professional colleagues as well as for myself, that the "reflections from the mirrors and cornea" have not proved a hindrance to the easy and successful use of the electric ophthalmoscope, and even the "reflection" due to "etc.," has not asserted itself as an insuperable barrier.—I am, etc.,

London, W., Sept. 23rd. C. O. HAWTHORNE.

STERILIZATION OF MENTAL DEFECTIVES.

The Medical Importance of Clearly Defined Biological Terms.

SIR,—I have read with much interest the correspondence on mental defect and sterilization, which began with Sir Archdall Reid's letter in the JOURNAL of August 26th. Some of the letters following his serve to illustrate the immense importance of Sir Archdall's clear, although condensed, exposition of his views concerning the great lack of precision in the terms used by nearly all writers on heredity.

The discussion concerning biological terminology, and on heredity in particular, which was published in *Nature* from time to time from November, 1920, to May, 1922, and is referred to by Sir Archdall in his letter to you, contains a full exposition of his contentions; and a study of it could not fail to be of high value to practitioners of medicine, most of whom have hitherto been mainly dependent on biological teaching for an understanding of the whole subject of heredity, with which they are necessarily and greatly concerned. In this discussion the importance of the distinction between "inheritance" and "reproduction" is brought out vividly, as well as the real meanings and applicability of the words "inherit," "innate," "acquire," "germinal," "somatic," and the like. All these are key-words. Without a clear understanding of their implications all controversy about heredity is futile. So also is all discussion of the question of sterilization of the feeble-minded.—I am, etc.,

London, W., Sept. 21st. BRYAN DONKIN.

P.S.—This letter was written before seeing Sir Archdall Reid's letter in the JOURNAL of September 23rd.

EDINBURGH MILK SUPPLY.

SIR,—My attention has been directed to your issue of August 19th containing some extracts from the report of the Board of Health for Scotland during the year 1921.

The reference is chiefly to the quality of the milk in Scotland, and the figures given raise a presumption strongly adverse to the Edinburgh supply. Indeed, so large is the divergence as to lead me to suggest that the writer of the article referred to might have at once recognized that some fallacy underlay them, and have made such inquiry as was necessary to remove this before drawing the conclusions contained in the summary.

The actual fact is the figures cited are based on different sets of circumstances. Those applicable to Scottish cities generally represent adulterated samples in regard to which proceedings could be taken under the Food and Drugs Acts, while the higher figures applicable to Edinburgh represent the result of several analyses of each sample before any legal proceedings are instituted.

Thus each unit in the figure stated as being applicable to Edinburgh represents three and sometimes four samples of the *same supply of milk* purchased or procured at different places in order to ensure that the person guilty of the illegal act will be proceeded against and that the interests of the innocent vendor will be safeguarded. The writer of the article has been comparing things that differ, and thus forming entirely erroneous conclusions.—I am, etc.,

A. MAXWELL WILLIAMSON, M.D.,
Medical Officer of Health.

Public Health Department, Edinburgh, Sept. 19th.

*** The matter is one between Dr. Maxwell Williamson and the Scottish Board of Health. We cannot agree that, having compared the text with the relevant table, it was our duty to make further investigation. The passage relating to milk samples in the official report, on which our own comments were based, is as follows:

> "In the Burghs of Edinburgh, Dundee, Glasgow, and Aberdeen, the proportions of adulterated samples were 39.6, 8.8, 7.3, and 5.8 per cent. respectively. In the 12 other Burghs, with a population over 30,000, the proportion was 8.3 per cent., and in the remainder of the country 8.6 per cent."

From beginning to end of the report there is no hint of any "different sets of circumstances." We are pleased, however, to give Dr. Williamson the opportunity of making much-needed explanation.

PROMOTION IN THE R.A.M.C.

SIR,—A few weeks ago, having recently returned from abroad, I consulted the *Monthly Army List* for the whereabouts of some A.M.S. and R.A.M.C. friends, and what I noted led me first to study the *Quarterly List* and "Hart," and, secondly, to question certain men whose names I had not

found in the list. The net results of this study I venture to submit for your consideration. They are as follows:

1. Majors R.A.M.C. average greater length of service than majors in other corps of an allied kind, besides being older in years.
2. Some fourteen or fifteen A.M.S. colonels are being retained in the service beyond the time limit for this grade.
3. From the Medical Department list as a whole have disappeared the names of a considerable number of men, from among whom it seemed certain that several major-generals and probably a D.G. would sooner or later be chosen.

To put these facts in another way: (*a*) During the war a large number of senior officers were either brought back or retained beyond their time, and thus blocked promotion to substantive rank of the men below them. Now, four years later, and without any equivalent reason, a like condition still obtains. (*b*) This accounts for the exceptional oldness in the service of majors R.A.M.C., and explains the close approach to retirement age of sundry men above them. (*c*) Blockage of promotion means more than disappointment to individuals; it also spells possible grave loss to the service by some of those individuals (who may be officers of a specially desirable type) being led to resign. Some men of this order, including one or two whom I should class as brilliant, have in fact already left.

But this is not the only undesirable circumstance. Promotion above the rank of major and above the rank of lieutenant-colonel and colonel depends on "selection." Every officer can tell to a second the date on which his "batch" is due for promotion if there be no blockage and if no one is "passed over" or removed by death; but I have never yet known one who could predict how the selection factor would work out. In fact, no one in the service knows in what direction or directions he must shine if he hopes to obtain the votes of the selection board which will eventually decide his fate. The general impression seems to be that the essential thing is to have served under one or more members of the board and to have got on with them; in short, that promotion goes largely by favour. Without accepting this view I yet express a doubt as to whether even the board itself could state offhand to what touchstone or touchstones it applies the records of the officers concerned. Are they wide general experience? or success in administrative or executive positions in peace times, or the same on active service? or exceptional knowledge of some clinical, laboratory, or other special branch of work? or knowledge of languages? or a capacity for getting on with one's fellows?

It appears to me that in all public services in which promotion is by selection—and of these there are several—the points on which promotion depends ought to be thoroughly well known to every officer from the beginning of his career.

Finally, so far as the R.A.M.C. is concerned, I suggest that although it is a very popular service at the present time, and one of which most of us are proud, it will not so remain if the condition of matters herein described continues for any considerable further period. The existing blockage should be cleared away forthwith, and the R.A.M.C. should set an example to all other public medical services by making known what are the points that count officially when selection is in question.—I am, etc.,

September 17th. G. N. STEPHEN.

THE DETERMINATION OF SEX.

SIR,—Interest in the determining factor or factors in the production of sex naturally never wanes, and from time to time a new idea is mooted or an old one resuscitated. Some suggestions, such as that ova proceeding from a right ovary alone produce males, have been definitely disproved by observation, and others—for example, that the provision of an abundant supply of a particular form of nourishment to the mother will determine the sex of the embryo—are prima facie unlikely.

We may expect that in the production of sex it is inherently probable that the male will play as vitally important a part as the female, and both of the above suggestions are manifestly defective in allowing no part to the male.

Moreover, it is also to be anticipated that some natural law or laws will underlie the determination of sex, and further that such law or laws will act towards the equalization of the number of the two sexes.

For a long time past it has seemed to me that one simple suggestion, which I have not hitherto seen noted, fulfils the before-mentioned conditions, and it might be shortly stated as follows: That in the reproductive process each sex tends to reproduce its opposite, the resultant of the strife between the two being the manifestation as to which had gained the upper hand. Thus if a male child results then the ovum has proved the stronger, and vice versa.

If my surmise is correct, and such a law does exist, then our interest would be more advantageously concentrated on finding out and investigating the factors which make for strength and for the gaining of the mastery. These factors are doubtless numerous, and possibly complicated, but my own observation leads me to believe that they will include not only such points as physical build and condition or acquired or inherited powers or weaknesses, but also such questions as relative age of the parents.—I am, etc.,

Manchester, Sept. 22nd. R. W. MARSDEN, M.D.

ALOPECIA AREATA AND STRABISMUS.

SIR,—Dr. Goodwin Tomkinson has given us in your issue of September 16th, 1922, a most interesting family group of cases in which alopecia areata is linked with strabismus, the latter condition having been investigated by Dr. Hislop Manson.

To some of us who have followed Dr. Inman in his association of strabismus with a personal or family history of left-handedness or stammering, the record is of great importance. Dr. Inman has not selected at random certain eccentricities of childhood for special inquiry, but he has grouped a class of defects which he believes to be of psychological import.

It is clear from Dr. Tomkinson's cases that there were other psychical symptoms among them, the mother having suffered from "bilious" headaches, possibly migraine, as well as anaesthesiae; five children also are stated to have been "nervous" and one a somnambulist. These indications are most suggestive. Obviously there is a line of research opening up which may yield valuable results if the various branches of the profession will contribute from various sources their experience as to analogous cases.

There is little doubt that if the cause is, as we suppose, psychological it should be dealt with by psychological methods; a great opportunity opens for practitioners who employ psychotherapy to find a solution of the problem.—I am, etc.,

London, E.C., Sept. 20th. CHARLES F. HARFORD.

PSYCHO-ANALYSIS.

SIR,—The letter of Dr. Johnstone (p. 578) illustrates very well my point as to the necessity of educating the medical profession in the principles underlying modern psychotherapy.

Apparently he sees no difference between psychology as taught fifty years ago and the teachings of to-day, and it would take far more space than you could allow me to endeavour to bring his conceptions up to date. One cannot argue with a person who understands by the unconscious "the part of the brain for the moment inactive" as one would not be speaking the same language. The unconscious is dynamic, not static.

With regard to the possibility of the patient bringing hypothetical dreams to the analyst, this would not matter in the least as the patient's inventions would be the outcome of his mental processes exactly as are genuine dreams. As a matter of fact we sometimes ask our patients to invent dreams when they can produce no other material. I think Dr. Johnstone will agree that the inventions of a poet or a novelist must bear a direct relation to the author's psychological make-up, and the same is true of everyone.—I am, etc.,

R. MACDONALD LADELL.

Wylde Green, Birmingham, Sept. 23rd.

BACTERIAL FILTRATION.

SIR,—It has occurred to me that your readers might be interested to hear of a cheap and rapid method of filtering fluids containing bacteria in suspension.

Take an ordinary filter funnel, fold two thicknesses of stout good filter paper and almost fill up with clean sand (washed several times in a pan). Pour in water to make the sand settle down firmly and until the filtrate is colourless. (The colour is due to sand in suspension, fine enough to pass through the filter paper.) Scoop a cone in the firm sand, pour in the fluid cautiously so that

the fluid comes into contact only with sand and nowhere comes into first contact with the filter paper. Reject the first few filtrations.

Soluble protein should be tested for in urine one can read print through; but in bacilluria bacteria often remain in suspension even after centrifuging. The above method gets over this difficulty and does away with the necessity of candling.—I am, etc.,

TEMPLE GREY.

United University Club, Sept. 18th.

OPEN-AIR TREATMENT OF MEASLES: AN EXPERIMENT.

SIR,—Dr. Gee wrote in *Medical Lectures and Clinical Aphorisms*:

"Any mysterious change of type or epidemic constitution seems to be resolved so far as concerns measles into the condition of the air breathed by the patients."

During a recent epidemic of measles the cases that did worst were children shut off from light and air and heavily clothed.

The one case that did best was a delicate little girl that lay or sat up in bed lightly covered and under a big window, opened some eighteen inches from the top and with a badly fitting lower sash, so that light and air poured over her. One night when her fever and rash were at their height she kicked the bedclothes off and lay naked for some time till found so by her mother. There was no ill result. The rash did not go in. There were no pulmonary complications. Three days after the rash first appeared her tongue was clean, her appetite good, and she was playing with her toys. This quick return to health, as well as an easy time while rash and fever were on her, was in marked contrast to cases treated in what one would call a "well-ventilated" room; it was marvellous as compared with cases treated by warmth and stuffiness.

The above "experiment" was carried out by the mother. From what I read in my books, none of recent date, I would have hesitated to expose a case of measles so freely to currents of air and floods of daylight.

This case occurred at a time when the epidemic was at its height. In view of some articles recently in the BRITISH MEDICAL JOURNAL I should add the mother was giving cold water when I was called in.

The patient's younger sister took measles shortly after, and in a hot kitchen looked ill and coughed incessantly. At my suggestion she was given the same environment as the elder child had enjoyed, and with happy result. A cough mixture with paregoric, which was indicated, lay practically untouched, as the mother said the cough had almost ceased after the patient was transferred to the airy room.

—I am, etc.,

CHARLES J. HILL AITKEN, M.D.

Kilnhurst, nr. Rotherham, Aug. 31st.

SENIOR SURGEON COMMANDERS AND THE ADMIRALTY.

SIR,—The case of the senior surgeon commanders of the Naval Medical Service has been very ably represented by the British Medical Association, and your leading article of July 8th (p. 52) has placed all the salient points before members of the profession.

The Admiralty, by its curt refusal to remedy the grievances, and by its unjust treatment of those medical officers whose long and good service might, at any rate, have been thought worthy of some consideration, has shown that nothing less than pressure by the profession is necessary in order that these grievances may be removed and that regulations under which medical men elect to join the navy may not be treated as "scraps of paper." The only way in which pressure can be exercised is by medical men refusing to enter the service, and it will be the only way that will be understood by their lordships or the powers that be, whether bureaucrats, autocrats, or our own complacent people in their armchairs at the Admiralty, and until such pressure is exercised things will go on in exactly the same way.

But, surely, Sir, having placed the matter so ably before the profession, it is somewhat inconsistent for the JOURNAL to continue to insert Admiralty advertisements for medical officers for short service. If the conditions of the service were what they ought to be it would not be necessary to resort to this method of obtaining medical officers, and if the Admiralty can obtain men in this way it will not care about any warning from the British Medical Association.

I hope, therefore, that the BRITISH MEDICAL JOURNAL will not insert any further advertisements until the Admiralty has seen fit to mend its ways, to compensate those medical officers so unfairly retired before their time, and to give some guarantee that regulations shall not be treated as "scraps of paper."

The following is an extract from the Regulations for the entry of candidates for commissions in the Medical Department of the Royal Navy:

"Fleet Surgeon, Staff Surgeon, and Surgeon:
"Will be compulsorily retired as follows: At the age of 55, or at any age, if he has not served for five years."

This is taken from the Regulations, dated June, 1890, under which those surgeon commanders who have been recently retired under the new order joined.—I am, etc.,

EXPERTO CREDE.

Obituary.

SIR JAMES AFFLECK, LL.D., M.D., F.R.C.P., F.R.C.S.EDIN.,

Consulting Physician, Royal Infirmary, Edinburgh.

BY the death of Sir James Ormiston Affleck, Edinburgh has lost one of her most skilled, highly honoured, and well-beloved consulting physicians. For some months his friends had observed signs of failing health, but more recently Sir James was able to be about and was to have attended a consultation in the country on September 25th. His death in the end was sudden. He passed away in his sleep in the early hours of the morning of Sunday, September 24th. He exhibited in a high degree all the best features which went to construct the character of the physician of the later Victorian period—quiet dignity, courtly manners, knowledge founded upon close observation of clinical symptoms and upon a faculty of intuition, real sympathy, and unhurried advance to a treatment carefully thought out and all-embracing in its scope. At the same time no one knew modern advances in medicine better than Sir James Affleck, and no one could apply them more safely and satisfactorily and always with a touch of restraint, which was not without power. He could more than hold his own with the best of the Georgians, but his nature was not one in which "holding his own" had any personal significance, for no one was more unassuming and more ready to pay attention to every expression of opinion from another physician. He was essentially the physician's physician and the profession's favourite, and in his time he cheered countless sick beds amongst his brethren. When a well-known doctor in Edinburgh and neighbourhood was ill one had scarcely to ask whether Affleck had been to see him; it was taken for granted, so sought after and so helpful were his ministrations. In medical circles, in particular, his passing will be deeply felt.

James Ormiston Affleck was born in 1840 in the Stockbridge district of Edinburgh, not far from 38, Heriot Row, his home for many years and the place of his death. He studied at the university in his native city, and graduated there as M.B. and C.M. in 1867 and as M.D. two years later. In 1869, also, he assisted Sir Douglas Maclagan, Professor of Medical Jurisprudence and Public Health, in his teaching. In the years following he began to lecture on the practice of medicine in Surgeons' Hall, and was elected assistant physician to the Royal Infirmary (in charge of the fever wards). He was elected a Fellow of the Royal College of Physicians in 1875, and at the time of his death his name was third in order of seniority on the Roll. He had already (in 1869) become a Fellow of the Royal College of Surgeons of Edinburgh.

In 1885 he became a full physician and a lecturer on clinical medicine in the Royal Infirmary, and during his term of office there he attracted many of the more thoughtful and earnest type of student to his wards and teaching; and so impressed were they with what he had to give them that they began after graduation to return more and more to him for advice. In this way he built up the large and important consulting practice which continued with him to the very end. He was also in touch with the University, acting from time to time as examiner in medicine and clinical medicine. On his retirement from the acting staff of the infirmary he was appointed one of the consulting physicians, and began to act for a time as physician to the City Hospital for Infectious Diseases. He was also physician to the Royal Edinburgh

Hospital for Incurables, and at the time of his death was on the committee of management. Sir James Affleck was a member of the Medical Board for the Royal Edinburgh Asylum for the Insane, and for some years he acted as consulting physician to the Royal Maternity Hospital.

To all these public institutions he gave freely of his time, skill, and energy. Thus, he had a great deal many years ago to do with the founding of the Longmore Hospital (for Incurables); but he probably did most of all for the Royal Infirmary, being on the board of management, playing a part (always an unassuming one) in the various extensions and improvements, securing a balneological department, watching over the welfare and housing of the nurses, and striving ever for efficiency and economy. His connexion with the Royal College of Physicians of Edinburgh was also long and helpful. He was for many years an examiner for the licence and the membership, and an active member of the Library Committee; he was for a long time on the Council of the College, and had he been less retiring than he was he would almost certainly have occupied the presidential chair. His self-effacement, however, was not always such as to enable him to escape the recognition which was so ready to come to him. In 1908 the University of Edinburgh conferred upon him the honorary degree of LL.D., and three years later he received from His Majesty King George the honour of knighthood, to the great satisfaction of his many friends. He occupied the presidential chair of the Edinburgh Medico-Chirurgical Society from 1905 to 1907. He was a member of the Edinburgh Branch of the British Medical Association, was vice-president of the Section of Medicine at the Annual Meeting of the Association in 1896, when it met in Carlisle, and was president of the Section of Pharmacology and Therapeutics in 1898, when the Association held its Annual Meeting in Edinburgh. It was, again, perhaps his modesty which prevented him writing the textbook of clinical medicine which he could so well have done, but he preferred to teach by word of mouth, and therein he excelled. Sometimes, however, he took his pen in hand, as when he wrote many articles on medical subjects in the *Encyclopaedia Britannica* (ninth edition), when he gave contributions to the Medico-Chirurgical Society, and when he delivered his valedictory address as president of that society. He had always something to say that was worth listening to on these occasions, and his address on "Nature's object-lessons in disease" was novel, brilliant, short, and thought-provoking. His paper on "Lobar pneumonia" read in 1907 was the work of a master hand, and was specially powerful in respect of prognosis and treatment, as might indeed have been anticipated.

When one came into close contact with Sir James Affleck (writes a colleague), whether as student, as patient, as colleague, or as a practitioner in search for further light upon a difficult illness, it was his sympathy, his unfailing and unerring insight and understanding, and his resourcefulness which impressed one most, all of them combined with a shy reserve which was almost shrinking until the interest of the case or the strong feelings of the man brought his mind out into the open. He was not fond of what are called social occasions, but at home quietly no one could be more entertaining, for his mind was stocked with the best books and the best in books, and from such stores he gave freely to them who showed an encouraging interest. His counsel on all public matters, although he would not have admitted it, had extraordinary weight; and over and over again one traced beneficent decisions back to Sir James as their source. What he said "went." He was strongly although quietly religious, and one could not be long in his company without discovering this almost unconsciously.

He had a special interest in medical missionaries, and for many years acted as consultant physician in connexion with the Foreign Missions Committee of the United Free Church, although, again, few knew of this. He was likewise a great giver, disposing with wonderful freedom not only money but also time (often a more difficult gift) to almost everyone who asked. It has been said of him that he was almost an expert in helping lame dogs over stiles, but it remains to be pointed out that in so doing he seems to have cured also their lameness, for many of those whom he aided turned out great successes. No one who loved him could have wished for him a happier ending than that which he had when he passed away in sleep at the ripe age of 82.

Sir James Affleck was never married. Until her death a good many years ago his sister stayed with him. He is survived by an elder brother, a retired minister of the United Free Church, formerly of Auchtermuchty. The funeral at the Dean Cemetery, Edinburgh, took place on Thursday, September 28th.

THE sudden death is reported of Dr. GEORGE HENRY SMITH of Knutsford on September 25th. He graduated M.B., C.M.Aberd. in 1875, and was medical officer of the Knutsford Workhouse and District of the Bucklow Union. He had a seizure while attending a patient. Dr. Smith, who was a member of the Mid-Cheshire Division of the British Medical Association, accompanied Sir H. M. Stanley's expedition to the interior of Africa in search of Livingstone.

THE death is announced of Professor J. J. MACKENZIE, head of the Department of Pathology in the University of Toronto, at the age of 57. Professor Mackenzie was educated at the University of Toronto and graduated B.A. in 1886 and M.B. in 1889. After taking post-graduate courses at Berlin and Leipzig he returned to Canada, and for some years was bacteriologist to the Ontario Department of Health. He was appointed professor of pathology and bacteriology in the University of Toronto in 1900. During the war he served with No. 4 General Hospital (University of Toronto), and while at work in Salonica the symptoms apparently began of the obscure illness which was to prove fatal. It is supposed that he suffered from streptococcal septicaemia, possibly due to pyorrhoea. In the autumn of 1921 his condition became more serious and endocarditis developed. Professor Mackenzie was very popular with colleagues and students and was much beloved by those who knew him intimately.

THE death took place on September 2nd of Dr. ALEXANDER RIGHTER CRAIG, who had been secretary of the American Medical Association since 1911. Dr. Craig was born in 1868, and graduated B.A. in 1890 and M.A. in 1893 at Franklin and Marshall College, Pennsylvania, and M.D. at the University of Pennsylvania in 1893; in 1920 he received the honorary degree of D.Sc. from Franklin and Marshall College. Dr. Craig practised medicine in Philadelphia, and took a considerable part in the work of the American Medical Association, having been a member and chairman of many important committees. In 1911 he was elected secretary of the association, and from that time he devoted his life to its interests.

DR. ALAN KIDD, Superintendent of the Colombo General Hospital, died there on August 27th. He had recently been suffering from neurasthenia, and was on the point of going home on sick leave. He was educated at Queen's College, Belfast, where he held a medical scholarship, and graduated as M.B., B.Ch., and B.A.O. with honours in the Royal University of Ireland in 1909 and as M.D. of Belfast University in 1912. Entering the Colonial Medical Service, he was appointed to the island of St. Lucia in the West Indies, where he held the posts of resident surgeon of the Victoria Hospital, medical superintendent of the Lunatic Asylum, and bacteriologist, and after the war was appointed to Ceylon.

The Services.

DEATHS IN THE SERVICES.

Brigade Surgeon Lieut.-Colonel William Price, Madras Medical Service (retired), died at Coonoor, in the Nilgiri hills, of heart failure, on August 26th, aged 76. He was born at Limerick on December 18th, 1845, and educated at Queen's College, Belfast, graduating as M.D. and C.M. in the Queen's University, Ireland, in 1863. Entering the I.M.S. as assistant surgeon on April 1st, 1869, he attained the rank of brigade surgeon lieutenant-colonel on March 1st, 1893, and retired on April 7th, 1896. Before his retirement he held the post of Principal of the Madras Medical College, and Professor of Medicine therein.

Major William Joseph Tobin, R.A.M.C., was killed by a fall from his horse at Enniskillen on September 20th, aged 41. He was born on November 23rd, 1880, and, after taking the L.R.C.P.I. and L.R.C.S.I. in 1905, entered the R.A.M.C. as lieutenant on February 4th, 1908, attaining the rank of major after twelve years' service. He served in the war of 1914–18, was mentioned in dispatches in the *London Gazette* of August 15th, 1917, and held the acting rank of lieutenant-colonel for two years—from November, 1916, to December, 1918.

Medical News.

DR. B. H. SPILSBURY, whose lectureship in morbid anatomy and histology at St. Bartholomew's Hospital has recently been altered to a full-time appointment, and who in consequence is relinquishing the pathological work done by him on behalf of London coroners, has been appointed Honorary Pathologist to the Home Office in order that his services may still be available for criminal cases of special difficulty.

THE first of the new series of post-graduate lectures for the autumn session will be given in the West Lecture Hall, Royal Society of Medicine, 1, Wimpole Street, W.1, on Wednesday, October 11th, at 5 o'clock, by Sir James Galloway, on "The symptoms and treatment of certain unexplained granulomatous diseases." Further lectures have been arranged as follows: Dr. Eric Pritchard, "The feeding of infants from birth to the end of the second year"; Dr. Lakin, "Indigestion"; Mr. Zachary Cope, "Some important but ignored symptoms in acute abdominal disease"; Dr. S. A. Kinnier Wilson, "The old motor system and the new"; Mr. J. D. Mortimer, "The medico-legal position of the anaesthetist." Copies of the detailed programme can be obtained from the Secretary to the Fellowship at the above address.

IT is announced that the opening of the new biological department of McGill University, Montreal, next month will be attended by Sir Charles Sherrington, G.B.E., M.D., President of the Royal Society.

THE programme of lectures and discussions arranged by the Child-Study Society, London, has been issued. The meetings are held on Thursdays at 6 p.m., at the Royal Sanitary Institute, 90, Buckingham Palace Road, S.W.1. The session begins on October 5th with a lecture by Dr. C. W. Kimmins on "Visual humour." The three following meetings—October 19th and 26th and November 16th—will be devoted to the discussion of mental tests and the measurement of intelligence in children. On November 30th Dr. A. F. Tredgold will lecture on "Some problems relating to mental deficiency."

THE Scottish Board of Health has issued a report on the administration of the Sale of Food and Drugs Acts for the year 1922. This contains an abstract of the reports of public analysts for the previous year, and it is intended that a separate document of this kind should be published each year. The price of the report is 3s., and it is stated that unless there is a sufficient sale the publication in future years will not be permitted owing to the need for economy.

THE post-graduate lectures which have been given at the Manchester Royal Infirmary during the past few years will be continued this year, commencing on October 3rd. Besides the weekly lectures on general subjects given by the members of the honorary staff, a special course of six lectures on nervous disease will be given by Dr. Reynolds. This course will take place on Fridays, beginning October 6th.

AS already announced, a national conference on the milk supply will be held in the Council Chamber of the Guildhall on Monday, Tuesday, and Wednesday, October 16th, 17th, and 18th. All who are interested in the milk question and who desire to attend this conference should write for the necessary application form to Miss H. M. Willans, Honorary Secretary, 3, Bedford Square, London, W.C.1, as admission is only by ticket obtainable on or before Thursday, October 12th; no tickets will be issued during the conference itself either at the Guildhall or at 3, Bedford Square. Accommodation is limited and early application is desirable; this applies both to members of the conference and non-members, to whom tickets will be issued in order of application, though members' tickets will be given out first.

THE next meeting of the Society for the Study of Inebriety will be held in the rooms of the Medical Society of London, 11, Chandos Street, Cavendish Square, W., on Tuesday, October 10th, 1922, at 4 p.m., when Colonel L. W. Harrison, D.S.O., M.B., will open a discussion on "The relation of alcoholism to venereal disease." Each member and associate is at liberty to introduce visitors.

THE annual conference of the Guild of Health opens to-day (September 30th) at Girton College, Cambridge. The papers set down for discussion include one on "Auto-suggestion—its benefits and dangers," by Dr. William Brown, Wilde Reader in Mental Philosophy in the University of Oxford.

A FIFTH course of lectures for the diploma of Psychological Medicine will be held at the Maudsley Hospital, Denmark Hill, S.E.5. Part I of the course will commence on Tuesday, October 10th, at 2.30 p.m., when Sir Frederick Mott, K.B.E., F.R.S., will give the first of eight lectures on the anatomy of the nervous system; the other seven lectures will be delivered on succeeding Tuesdays at the same hour. Dr. F. Golla will deliver eight lectures on the physiology of the nervous system on Fridays at 2.30 p.m., commencing on October 13th. Eight lectures on psychology will be delivered by Dr. Henry Devine on Thursdays at 2.30 p.m., commencing on October 12th. Practical instruction and demonstrations will be given at each lecture. Part II of the course will follow in January, 1923.

DR. H. CRICHTON MILLER will give a course of ten lectures on elementary psychotherapy at the Tavistock Clinic for Functional Nervous Cases, 51, Tavistock Square, W.C.1, on Mondays, at 5.15 p.m., beginning on October 16th. Dr. J. A. M. Alcock will also give a course of six lectures on symbolism on Wednesdays, at 5.30 p.m., commencing on October 18th. The fee for the former course is £2 2s. for medical practitioners and £1 1s. for medical students, and for the latter course £1 1s. Tickets can be obtained in advance from the Honorary Secretary at the clinic.

THE annual service in connexion with the Guild of St. Luke will take place at St. Paul's Cathedral on Wednesday, October 18th, at 7 p.m., when the Rev. Lord Victor Seymour will preach. The offerings, after defraying the cost of the service, will be devoted to the Cathedral Repair Fund. Tickets may be obtained from the Guild Secretary, the Rev. H. Kirkland-Whittaker, M.D., Chaplain's House, Banstead Downs, Sutton, on sending stamped addressed square envelope.

THE Minister of Health has issued an Order (No. 1026 of 1922) rescinding the Health Visitors (London) Order, 1909, under which the Local Government Board made regulations for the qualification, appointment, duties, salary, and tenure of office of health visitors in London.

AT the Congress of Nursing and Social Medicine held at Bruges on August 7th an International Midwives Association was formed with the following members of council: Professor Frans Daels of Ghent, Dr. Putto of The Hague, Miss Emily Ford of London, and Mrs. van der Else of Haarlem.

AT a meeting of medical women held recently in Toronto preliminary steps were taken to form a Canadian Medical Women's Association. Dr. Sproule-Mason was appointed acting president and Dr. Isabel Ayre of Toronto was appointed acting secretary. Dr. Jennie Smillie attended the recent International Conference of Medical Women at Geneva (reported in the SUPPLEMENT of September 16th, p. 111) as a delegate from this Canadian association.

THE Medical Golf Cup Tournament at Llandrindod Wells was brought to a successful conclusion on Thursday, September 21st. The weather was delightful throughout the competition. Dr. Hunot (Pennard) and Dr. Baird (St. Leonards) were the finalists, the former winning on the last green. The cup (value 50 guineas) was presented by Lieut.-General Sir Herbert Watts, K.C.B., K.C.M.G. The competitors were entertained to dinner at the Hotel Metropole by the local committee on Thursday evening.

THE annual conference of the Chartered Society of Massage and Medical Gymnastics will be held in London on October 5th, 6th, and 7th. Lectures will be given at the Steinway Hall, Lower Seymour Street, Portman Square, by Sir W. Arbuthnot Lane, Mr. R. C. Elmslie, Sir Maurice Craig, and others. A demonstration will be given in the physico-therapeutic department of St. Thomas's Hospital, and a demonstration of gymnastic class work for curative purposes at the Chelsea College of Physical Education. The secretary of the society is Miss E. M. Templeton, 157, Great Portland Street, London, W.1.

THE inaugural meeting of the Guy's Hospital Pupils' Physical Society will be held on October 12th at 5 p.m., when Sir Charters Symonds will give an address on "Some Guy's surgeons and their writings," with portraits and other illustrations. Sir William Hale-White will be in the chair. We note with interest that a joint clinical and pathological meeting with the Physical Society of St. Thomas's Hospital is to be held on November 30th.

DURING 1921 596 cases of small-pox occurred in Switzerland, with 8 deaths. Of the patients 23 were vaccinated, 16 had been revaccinated, 359 were unvaccinated, and in 198 no information could be obtained. Of the 8 fatal cases 7 were unvaccinated and 1 revaccinated.

THE St. Louis Emergency Relief Committee for German and Austrian universities has made a donation of 30,000 marks to the University of Halle.

THE will of the late Sir Edward Malins, M.D., Emeritus Professor of Midwifery in the University of Birmingham, who died in July last, has been proved; he left net personalty of £30,458.

THE annual dinner for past students of the London Hospital will be held on Thursday, October 12th, at 7.30 p.m., at the Trocadero Restaurant, with Sir Arthur Keith, M.D., F.R.S., in the chair. The honorary secretaries for the dinner are Messrs. H. S. Souttar and E. C. Lindsay, from whom tickets can be obtained.

Letters, Notes, and Answers.

As, owing to printing difficulties, the JOURNAL *must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.*

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London;* telephone, 2630, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London;* telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Mediocra, Westrand, London;* telephone, 2630, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin;* telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh;* telephone, 4361, Central).

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

QUERIES AND ANSWERS.

ASTHMA.

SIR JAMES DUNDAS-GRANT, replying to an inquiry regarding the development of asthma after the removal of nasal polypi (JOURNAL, September 23rd, 1922, p. 582), refers to a paper on nasal diseases in relation to asthma which he published in the *Practitioner* of June, 1913. He stated there that the incomplete removal of polypi had been known to wake up a quiescent asthma, and, indeed, that asthma was found sometimes to be relieved by removal of a small polypus, and quite unaffected by the clearance of large ones. The explanation was probably that a small polypus might, by intermittent contact, "tickle" the sensitive areas of the mucous membrane in the way that a large polypus in continuous and equable contact might fail to do. A small remnant of polypus might, therefore, act in the former way until it was completely removed.

INCOME TAX.

"X. G. S." writes: The assessor has added the rental value of my sanatorium to the amount assessed by him under Schedule D, although it is assessed under Schedule A; is this correct?

*** "X. G. S." does not say for what purpose the addition is made; presumably, in calculating the amount of profits to be assessed under Schedule D, the amount of the Schedule A assessment was deducted as the rent equivalent, and, consequently, if the *total* profits have to be ascertained, the two assessments must for that purpose be added together.

"P. and Q." were in partnership on the basis of equal shares, though "Q." accounted for two-thirds of the receipts; "Q.'s" share has been sold, and "P." is now separately assessed on the basis of half the profits of the former combined practice.

*** "P." is undoubtedly liable in respect of the past profits of the practice as now constituted, and he has a right of appeal to the Local—or, if preferred, to the Special—Commissioners, who would no doubt hear an accountant on his behalf if he wished. If the professional expenses borne by "P. and Q." were in the same ratio as their cash receipts then it is clear that "P.'s" practice is only one-half as profitable as that formerly carried on by "Q." On any other hypothesis the facts must be gone into in detail somewhat as follows: If "P.'s" gross earnings were £1,000 and his expenses £x, and "Q.'s" expenses were £y, then "P.'s" assessment should bear the same ratio to "R.'s" assessment as £1,000 – £x bears to £2,000 – £y. At the same time "P." will, of course, understand that he can appeal only in respect of his own assessment, and that he may have to confine himself to showing what is the average profit of the "P." practice, without direct reference to "R.'s" assessment, which, strictly, is not in issue. This he can do by taking the average profit as measured by the excess of the fees paid on account of his practice over his expenses.

THE PORTUGUESE RIVIERA.

DR. ST. GEORGE B. DELISLE GRAY, M.O. in charge of British Hospital, Oporto, writes: In answer to "M.D.'s" question (August 19th, p. 332) about the Portuguese Riviera for bronchitics, I think his patient would find it most suitable. Mont Estoril has quite a delightful climate and is a winter resort. Cintra should be avoided on account of its liability to mists. The cost of living in Portugal at present, on account of the exchange, is absurdly cheap; but no doubt English visitors would cause prices to rise if they came out in any numbers. The Portuguese are great bargainers, and always ask much more than they are prepared to accept. Hotels vary very much in accommodation, cleanliness, and culinary arrangements. At Mont Estoril they are supposed to be quite good. English visitors will have to shut their eyes to much, especially in the more rural parts of the country. Sanitation frequently leaves much to be desired. I believe a good many English visitors go to Mont Estoril during the winter, so that his patient need not feel isolated. In addition, it is within easy reach of Lisbon, which is a fine modern city. Last month my wife and I put up at a first-class hotel in Lisbon for the inclusive charge of 10*s.* per day each; this I remark just to give some idea of prices.

Portugal is a very beautiful country with many historic associations, especially for the British. The Portuguese are an extremely courteous race and expect to be treated with politeness, especially in their own country. They are most considerate to strangers, but resent being looked upon as foreigners by British and other visitors to Portugal, as is too often the case. My relations with them have always been the pleasantest, and I have received nothing but courtesy and kindness from them in all my dealings. Many speak English, more speak French. For further details I would refer to the following works by Dalgado: *The Climate of Portugal*, Lisbon, 1914; *The Climate of Lisbon, Mont Estoril, and Cintra*, London, 1904; *Notes on the Climate of Mont Estoril and the Riviera of Portugal*, Lisbon, 1908. They will probably be in several public libraries, and almost certainly in the library of the British Museum. I shall be very glad to give any further information.

LETTERS, NOTES, ETC.

HERPES WITH FACIAL PARALYSIS.

DR. J. OWEN WILLIAMS (Glandyfi, Cardiganshire) writes: As bearing upon what Dr. J. F. Gordon writes (September 16th, p. 538), I may say I have during this last month had two cases of herpes in youths over the regions which he names (but perhaps not so extensive facially), and each has completely recovered. They were both on the left side. It is possible that the age of his patient—72 years—may have made him more liable to the facial paralysis.

A VACUUM FLASK FOR WARMING GAS IN PERITONEAL INFLATION.

DR. F. HERNAMAN-JOHNSON (London, W.) writes: I regret that in describing a method of warming CO_2 for pneumoperitoneum (footnote to report of Glasgow discussion, BRITISH MEDICAL JOURNAL, September 16th) I omitted to say that I got the idea of the thermos flask from seeing Dr. C. T. W. Hirsch use one in his anaesthetic work.

URINE TESTS.

DR. G. WASHINGTON ISAAC (London, W.C.) writes: Some inconvenience arises when using Fehling's solution (two bottles) owing to the fact that the stoppers of the bottles become fixed by the crystals that form around them; these crystals, by hygroscopic or capillary action, draw the fluid up and it runs down the outside of the bottle and makes a mess. The application of soft or hard paraffin to the washed and dried stoppers prevents them for a time from becoming fixed, but interferes with a smooth flow of the fluid over the edge of the lip, so that it is impossible to measure a small quantity accurately. For albumin I chiefly use acetic acid, brine, and heat, and here again I am troubled by the crystals of sodium chloride which form all around the stopper of the drop bottle and interfere with the free passage of the solution, and if one greases the stopper the solution will not drop. Perhaps a chemist will be good enough to say whether these inconveniences could be removed by the addition of glycerin without upsetting the accuracy of the tests.

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 30, 31, 34, and 35 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 32 and 33.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page *128*.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

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Whole single column (three columns to page) ...	7	10	0
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An average line contains six words.

All remittances by Post Office Orders must be made payable to the British Medical Association at the General Post Office, London. No responsibility will be accepted for any such remittance not so safeguarded.

Advertisements should be delivered, addressed to the Manager, 429, Strand, London, not later than the first post on Tuesday morning preceding publication, and, if not paid for at the time, should be accompanied by a reference.

NOTE.—It is against the rules of the Post Office to receive *poste restante* letters addressed either in initials or numbers.